SOIL SURVEY OF

Kendall County, Illinois

United States Department of Agriculture
Soil Conservation Service
In cooperation with
Illinois Agricultural Experiment Station

This is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and agencies of the States, usually the Agricultural Experiment Stations. In some surveys, other Federal and local agencies also contribute. The Soil Conservation Service has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in the period 1967 to 1971. Soil names and descriptions were approved in 1972. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1971. This survey was made cooperatively by the Soil Conservation Service and the Illinois Agricultural Experiment Station and financed partly by the Kendall County Board of Supervisors. It is part of the technical assistance furnished to the Kendall County Soil and Water Conservation District.

Illinois Agricultural Experiment Station Soil Report No. 95

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, estates, and public lands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Kendall County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the management group of each. It also shows the page where each soil is described and the tree planting group and wildlife group in which the soil has been placed.

Individual colored maps that show the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those that have a moderate limitation can be colored yellow, and those that have a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the discussions of the management groups, tree planting groups, and wildlife groups.

Foresters and others can refer to the section "Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others concerned with wildlife can find information about soils and wildlife in the section "Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for dwellings, industrial buildings, and recreation areas in the sections "Use and Management of the Soils."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Kendall County may be especially interested in the section "General Soil Map" where broad patterns of soils are described. They may also be interested in the information about the county given in the section "General Nature of the County."

Cover: Aerial view of the Fox River Valley, facing east. Town of Yorkville is in soil associations 2, 3, and 4. On left is association 3, adjacent to the river is association 2, and on right is association 4.

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SOIL SURVEY OF KENDALL COUNTY, ILLINOIS

BY JOHN E. PASCHKE, SOIL CONSERVATION SERVICE

SOILS SURVEYED BY JOHN E. PASCHKE AND BRUCE E. CURRIE,[1] SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE,
IN COOPERATION WITH THE ILLINOIS AGRICULTURAL EXPERIMENT STATION

KENDALL COUNTY is in the northeastern part of Illinois (fig. 1). It is made up of nine geographical townships and nine political townships. Kendall County has an area of 204,800 acres, or 320 square miles, and is approximately 18 miles square. The population is heavily concentrated along the Fox River, in and around the towns of Oswego, Yorkville, and Plano.

General Nature of the County

The first permanent settlement in what is now Kendall County was made in 1826 at Holderman's Grove in the southwestern corner of Big Grove Township. The county was established in 1841 from parts of Kane and La Salle Counties. The population had increased to about 13,000 persons by 1860, it remained stationary until after 1880, gradually declined to 10,074 by 1920, but had increased to 26,374 persons in 1970.

Farming is the principal enterprise in Kendall County. According to the 1969 Census of Agriculture, about 82 percent of the acreage is cultivated. The proportion of land in farms has remained constant for many years but is now steadily declining each year. The number of farms is decreasing, but the size of farms is increasing. In 1969 there were 759 farms, and the average size was 247 acres. Between 1964 and 1969 the value of land and buildings increased 70 percent.

Cash-grain is the principal type of farming, and livestock farms are scattered throughout the county. Corn and soybeans are the main crops. Oats, hay, wheat, and some truck crops are grown to a lesser extent. In 1969 corn and soybeans made up about 70 percent of the harvested acreage.

Livestock raising, although an important enterprise on many farms, has been decreasing, but the most marked decrease is in dairy cows. As a result of several poultry egg-producing enterprises, the number of chickens in the county has increased greatly.

Kendall County has a well-developed system of roads. Federal and State highways cross the county, and Interstate 80 goes through the county in the southeastern corner. An east-west tollway intersects Highway No. 47, 3 miles north of the county line. In addition, many hard-surfaced roads serve all parts of the county. A main-line railroad and three branch lines serve the county.

[1] Other soil scientists who contributed to the fieldwork are LOYAL M. REINEBACH, DONALD R. MAPES, GEORGE W. HUDELSON, and THOMAS S. HARRIS, Soil Conservation Service.

Physiography, Relief, and Drainage

Kendall County is in the Bloomington ridged plain and the Kankakee plain section of the Central Lowland Province

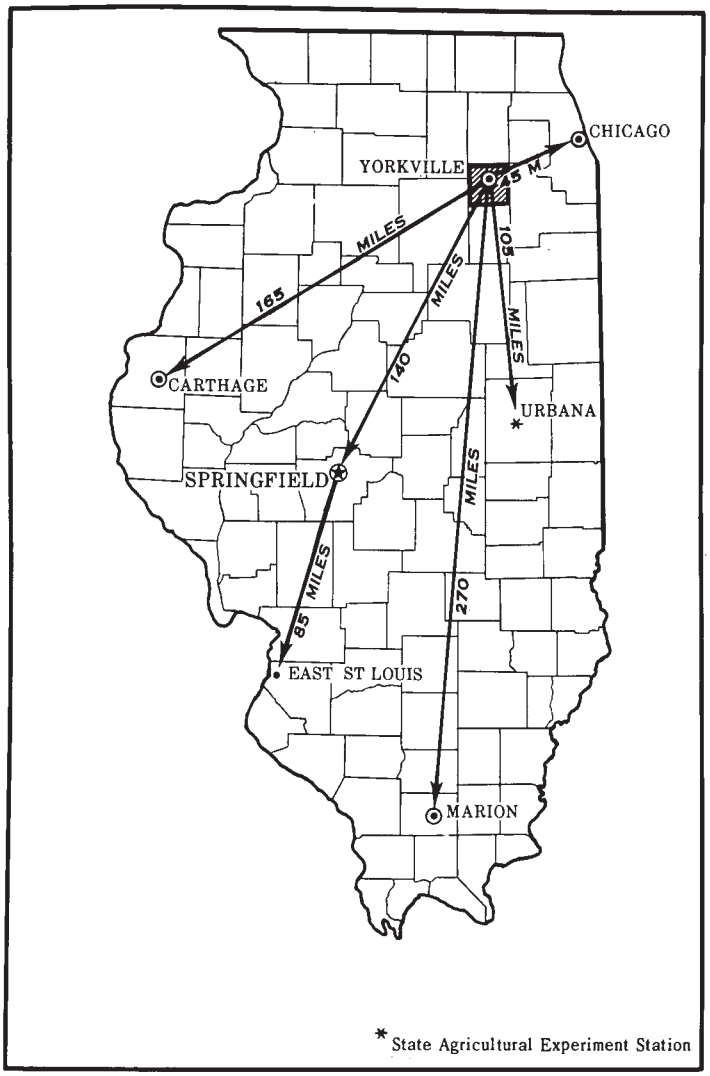

Figure 1.—**Location of Kendall County in Illinois.**

TABLE 1.—*Temperature and precipitation data*

[Data for temperature and rainfall are based on records for the period 1931–60. The data are a combination of records from Aurora and Morris]

Month	Average daily temperature	Average total precipitation[1]
	°F	*Inches*
January	25	1.7
February	27	1.5
March	36	2.4
April	49	3.2
May	60	3.7
June	70	3.9
July	74	3.0
August	73	3.2
September	65	3.0
October	54	2.7
November	39	2.1
December	28	1.8
Year	50	32.4

[1] Including all rainfall and melted snowfall. Normally, 10 inches of snow is the equivalent of 1 inch of water.

(*4*).[2] The Bloomington ridged plain section covers most of the county. Only the area of nearly level soils in the southeastern part of the county is in the Kankakee plain section.

The relief is mainly level to gently sloping but is rolling to steep in the morainal areas and along the river and stream valleys. The bedrock has been greatly modified by glaciation. Except for two large areas indicated on the General Soil Map and several small areas in the Fox River Valley, the bedrock is 20 to 130 feet below the glacial drift (*5*).

The elevation above sea level ranges from 800 feet on the Marseilles Moraine about 2 miles southwest of Yorkville to 550 feet in the channel of the Fox River at Millington.

Kendall County is drained entirely by surface streams. The northern and western two-thirds of the county drains to the Fox River, which flows south and west and into the Illinois River at Ottawa, Illinois. The rest of the county drains south directly to the Illinois River.

Climate

Kendall County has a typical continental climate of cold winters, warm summers, and frequent short-period fluctuations in temperature, humidity, cloudiness, and wind direction. Prolonged warm spells in summer are infrequent. Major droughts are infrequent, but somewhat long spells of dry weather during the growing season are not unusual.

Temperature and precipitation data based on records from Aurora, which is in Kane County just north of Oswego, combined with records from Morris, which is in Grundy County about 20 miles south of Yorkville, are shown in table 1. The probability of specified freezing temperatures in spring and fall are given in table 2.

The average length of the growing season in Kendall County is 159 days. The term "growing season" is somewhat misleading because different crops are damaged at different temperatures. Also, temperatures on ridges differ considerably from temperatures in valleys during radiation freezes, the type most common in Illinois. Crops grown in the closed depressions where Houghton and Peotone soils occur are likely to be damaged by frost in May and October (*3*).

Winter months are the cloudiest. The percentage of possible sunshine ranges from an average of less than 45 for the period November through February to nearly 70 for the period July through August.

Precipitation averages 32.4 inches a year. More than half falls during the growing season, May through September.

In summer most of the rain falls during showers or thunderstorms of short duration. The average number of thunderstorms a year is 35. Many thunderstorms produce more than an inch of rain. Hail and damaging winds occasionally accompany the thunderstorms. The hail is most likely to damage field crops if it falls during the period June to August, but during this period in any particular year, hail-producing thunderstorms average less than one in any one place (*2*). Not in all hailstorms are there enough stones of sufficient size and quantity to damage crops extensively.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soils are in Kendall County, where they are located, and how they can be used. The soil scientists went into the county knowing they were likely to find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes; the size and speed of streams; the kinds of native plants or crops; the kinds of rock; and many facts about the soils. They dug or bored many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends

TABLE 2.—*Probability of freezing temperatures in spring and in fall*

[All data based on temperatures recorded in a standard U.S. Weather Service shelter approximately 5 feet above the ground and in a representative location. At times the temperature is colder nearer the ground or in local areas subject to extreme air drainage. The data are based on a combination of records from Aurora and Morris for the period 1931–60]

Occurrence	Dates for given temperature				
	32° F	28° F	24° F	20° F	16° F
Average date of last in spring	May 2	April 21	April 6	March 27	March 15
Average date of first in fall	October 8	October 23	November 2	November 10	November 21
Average number of days between dates	159	185	211	228	251

[2] Italic numbers in parentheses refer to Literature Cited, p. 76.

from the surface down into material that has not been changed much by leaching or by the roots of plants.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform procedures. The *soil series* and *soil phase* are the categories of soil classification most used in a local survey (*6*).

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Saybrook and Bryce, for example, are the names of two soil series. All the soils in the United States that have the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Saybrook silt loam, 4 to 7 percent slopes, eroded, is one of the several phases within the Saybrook series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

In most areas surveyed there are places where the soil material is so disturbed that it cannot be classified by soil series. These places are shown on the map and are described in the survey, but they are called land types and are given descriptive names.

While a soil survey is in progress, soil scientists take soil samples needed for laboratory measurements and for engineering tests. Laboratory data from the same kind of soil in other places are also assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kind of soil. Yields under defined management are estimated for all the soils.

Soil scientists observe how soils behave when used as a growing place for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this failure to the slow permeability of the soil or to a high water table. They see that streets, road pavements, and foundations for houses are cracked on a named kind of soil, and they relate this failure to the high shrink-swell potential of the soil material. Thus, they use observation and knowledge of soil properties, together with available research data, to predict limitations or suitability of soils for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this publication shows, in color, the soil associations in Kendall County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and several minor soils, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map that shows soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of farming or other land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, drainage, and other characteristics that affect their management.

The seven soil associations in Kendall County are discussed in the following pages.

There are some differences in names of soil associations between Kendall and LaSalle Counties. These differences reflect changes in extent and patterns of soils in these counties.

1. Plano-Elburn-St. Charles association

Nearly level to gently sloping, well drained to somewhat poorly drained soils that formed in silt loam material and the underlying sandy loam glacial drift

This association is mainly nearly level, but some of it on low hills and along drainageways is gently sloping to moderately sloping. Most of the association is well drained by Little Rock and Big Rock Creeks and by the Fox River.

This association makes up about 13 percent of the county. It is about 40 percent Plano soils, 15 percent Elburn soils, 15 percent St. Charles soils, and 30 percent the minor Drummer, Knight, Proctor, Batavia, Thorp, Kendall, and Virgil soils (fig. 2).

The Plano and St. Charles soils are in higher areas than the Elburn soils. They are well drained, but the Elburn soils are somewhat poorly drained. All of these soils formed in deep silt loam material and in the underlying glacial drift. They have a surface layer of silt loam. The upper part of the subsoil is silty clay loam, and the lower part is clay loam. All of these soils have moderate permeability. The Plano and Elburn soils are high in organic-matter content, and the St. Charles soils are low.

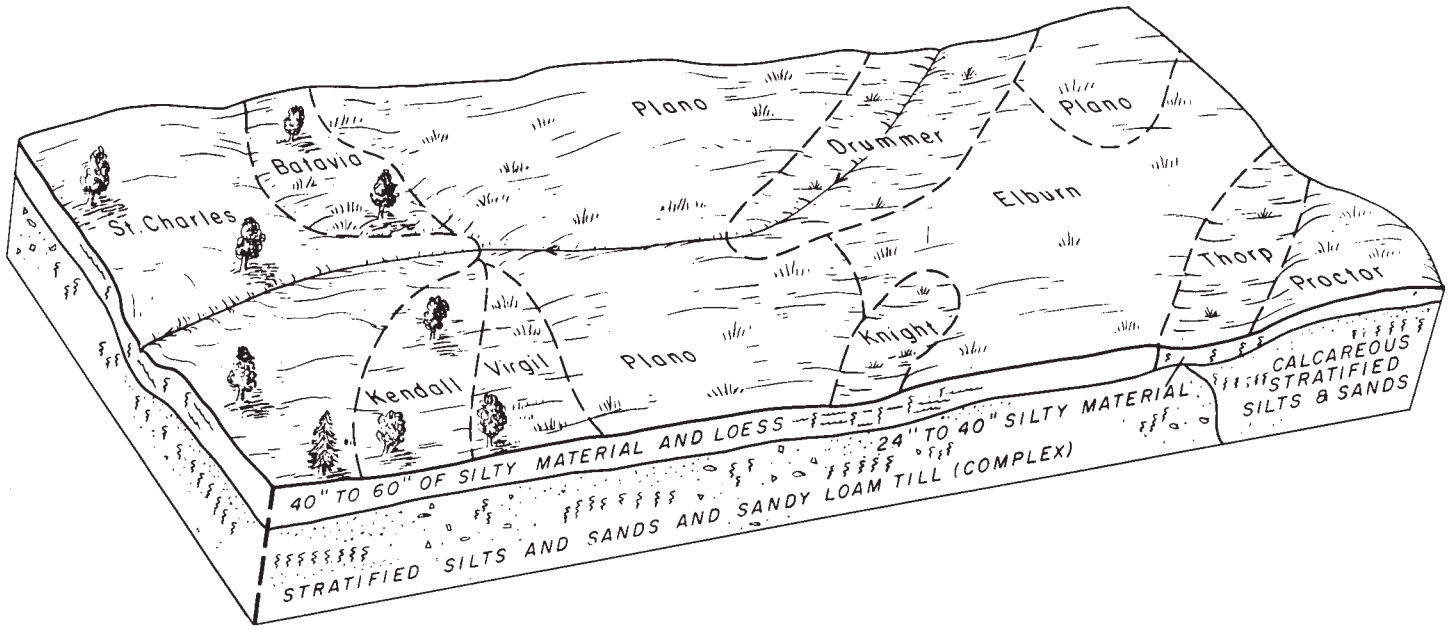

***Figure 2.*—Typical pattern of soils in the Plano-Elburn-St. Charles association.**

Of the minor soils, Proctor and Batavia soils are in higher areas than the Elburn soils. The Drummer, Thorp, Virgil, Kendall, and Knight soils are in the lowest areas.

The soils of this association are well suited to corn and soybeans. Most other crops also are well suited but are grown to a lesser extent. Urban expansion is taking many acres of the productive Plano soils out of cropland. Some areas of the Elburn, Drummer, Thorp, Knight, Kendall, and Virgil soils need artificial drainage. Tile drains and shallow surface drains provide adequate drainage. Erosion is a moderate hazard on the more sloping Plano and St. Charles soils.

2. *Millington-Lorenzo-Fox association*

Nearly level, poorly drained soils that formed in silt loam sediment and gently sloping to very steep, well-drained soils that formed in dominantly sandy loam to silty clay loam material and the underlying sand and gravel

This association parallels the Fox River and the major streams that enter it from the north. It consists of the nearly level Millington and other soils that formed in alluvium and that occupy the flood plains, the moderately sloping to very steep Lorenzo soils on the valley walls, and the gently sloping to moderately sloping Fox soils on uplands that border the creeks and the river (fig. 3).

This association makes up about 9 percent of the county. It is about 25 percent Millington and other soils on flood plains, 14 percent Lorenzo soils, 12 percent Fox soils, and 49 percent the minor Rush, Dresden, DuPage, Hennepin, and St. Charles soils.

DuPage soils are on the flood plain. The Rush, Dresden, Hennepin, and St. Charles soils are on uplands.

Millington soils are poorly drained and are loam to heavy silt loam throughout. Lorenzo and Fox soils are well drained. The Lorenzo soils are less than 2 feet of loam and sandy loam over sand and gravel. The Fox soils are 2 to 3 feet of silt loam and clay loam over sand and gravel.

The soils of this association are poorly suited to crops. Most of the woodland in the county is on these soils. This association is within the area of the most rapid urbanization in the county. Recreational facilities have increased significantly in recent years, and there are many plans for more development (fig. 4). Control of flooding and control of water pollution are the major concerns of management. Erosion is also a concern in the steeper areas that are left bare by cropping or construction work.

3. *Waupecan-Dresden-Brenton association*

Nearly level to gently sloping, well drained to somewhat poorly drained soils that formed in silt loam and loam material and the underlying sand and gravel

This association is on a glacial outwash plain. It is mainly nearly level, but in small areas it is gently sloping. All areas of the association are well drained by the Fox River and Blackberry Creek.

This association makes up about 7 percent of the county. It is about 50 percent Waupecan soils, 30 percent Dresden soils, 9 percent Brenton soils, and 11 percent the minor Drummer and Lorenzo soils.

Waupecan and Dresden soils are well drained. They formed in 2 to 5 feet of silty and loamy material over sand and gravel. Brenton soils are somewhat poorly drained and formed entirely in silty and loamy material. All of these soils have a surface layer of silt loam. The Waupecan and Brenton soils have a subsoil of silty clay loam and clay loam, and the Dresden soils have a subsoil of silty clay loam and

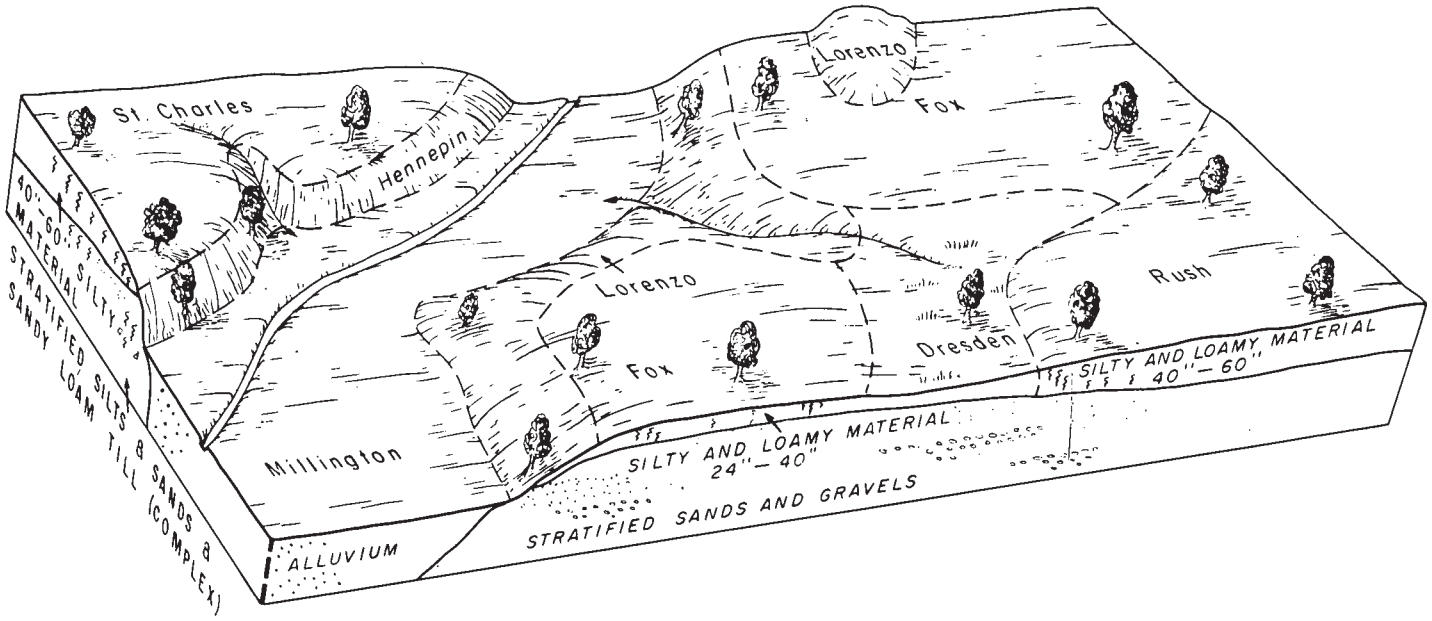

Figure 3.—**Typical pattern of soils in the Millington-Lorenzo-Fox association.**

gravelly loam. The Waupecan and Brenton soils have moderate permeability, and the Dresden soils have moderately rapid permeability. The Waupecan and Dresden soils are moderate in organic-matter content, and the Brenton soils are high.

The soils of this association are well suited to corn and soybeans. Some areas of the Brenton soils and the associated, lower lying Drummer soils need artificial drainage. Tile drains along with shallow surface drains provide adequate drainage. The risk of contamination of the ground water from septic field effluent is a major concern of management.

4. *Strawn-Dodge association*

Gently sloping to steep, well-drained soils that formed in silt loam material and the underlying loam and silt loam glacial till

This association has the most variable relief in the county. It is on a terminal moraine that has many irregularly shaped ridges or hills, valleys, and closed depressions (fig. 5).

This association makes up about 5 percent of the county. It is about 35 percent Shawn soils, 30 percent Dodge soils, and 35 percent the minor Drummer, Lisbon, and La Rose soils.

Figure 4.—**On right, an area of Millington soils in which there are five fishponds. On left, light-colored Fox soils.**

Figure 5.—**A recreational area in the Strawn-Dodge soil association. The pond is in an area of the Drummer soils.**

The Strawn and Dodge soils have a surface layer of silt loam and a subsoil of silty clay loam to clay loam. The lower part of the subsoil and the underlying material are compact, calcareous glacial till. The Strawn soils are moderately sloping to steep, and the Dodge soils are gently sloping to moderately sloping. Soils of both series have moderate to moderately slow permeability. They are low in organic-matter content and are subject to severe erosion if they are cropped.

The moderately steep and steep soils in this association are suited to permanent pasture or woodland. A high percentage of the smaller wooded areas in the county is in this association.

5. *Saybrook-Drummer-La Rose association*

Well drained to poorly drained, nearly level to strongly sloping soils that formed in silt loam material and the underlying silt loam to loam glacial till

This association consists of somewhat rolling end moraines where the elevation varies more than 50 feet and ground moraines where the elevation varies less than 20 feet.

This association makes up about 33 percent of the county. It is about 38 percent Saybrook soils, 28 percent Drummer soils, 13 percent La Rose soils, and 12 percent the minor Lisbon soils and 9 percent the minor Brenton and Varna soils.

The Saybrook and La Rose soils are moderately well drained to well drained, and the Drummer soils are poorly drained. The Saybrook and Drummer soils formed in 2 to 3 feet of silty material and in the underlying material, and the La Rose soils formed in less than 2 feet of silty material and in the underlying compact, calcareous glacial till. The Saybrook and Drummer soils have moderate permeability, and the La Rose soils have moderate to moderately slow permeability.

Of the minor soils, Lisbon soils are somewhat poorly drained. They formed in 2 to 3 feet of silty material and in the underlying glacial till. They have moderate permeability. The Brenton soils are somewhat poorly drained, and the Varna soils are moderately well drained to well drained.

The soils of this association are well suited to corn and soybeans. Other crops also are well suited but are grown to a lesser extent. Drummer soils and many areas of Lisbon and Brenton soils that are at a lower elevation need artificial drainage. Erosion is a severe hazard on the La Rose soils and a moderate hazard on the gently sloping Saybrook soils.

6. *Drummer-Mundelein-Brenton association*

Nearly level, poorly drained and somewhat poorly drained soils that formed in silt loam material and the underlying glacial outwash

This association is on a glacial outwash plain. It is mainly nearly level, but in small higher areas it is gently sloping. Dug ditches provide drainage outlets for all these areas.

This association makes up 19 percent of the county. It is about 37 percent Drummer soils, 22 percent Mundelein soils, 15 percent Brenton soils, and 10 percent the minor Proctor soils and 8 percent the minor Barrington, Plattville, Ripon, and Milford soils.

The Drummer soils occur at a slightly lower elevation than the Mundelein and Brenton soils. The Drummer soils are poorly drained, and the Mundelein and Brenton soils are somewhat poorly drained. All of these soils formed in silty material and in the underlying outwash. Drummer soils have a surface layer of silty clay loam and a subsoil of mainly silty clay loam over stratified sandy loam and loam. Mundelein soils have a surface layer of silt loam and a subsoil of mainly silty clay loam over stratified clay loam and silt loam. Brenton soils have a surface layer of silt loam and a subsoil of silty clay loam and clay loam over stratified sandy loam, silt loam, and sand. The Mundelein soils are strongly alkaline in the lower part of the subsoil. All the major soils are high in organic-matter content and have moderate permeability.

Of the minor soils, Milford soils are poorly drained. Erosion is a moderate hazard on the more sloping Proctor, Barrington, and Plattville soils. Plattville and Ripon soils have limestone bedrock within 5 feet of the surface.

The soils of this association are well suited to intensive cropping. Corn and soybeans are grown on a high proportion of the acreage. The Drummer soils and many areas of the Mundelein and Brenton soils need artificial drainage. Tile drains along with good outlets provide adequate drainage.

7. *Swygert-Bryce-Martinton association*

Nearly level, somewhat poorly drained and poorly drained soils that formed in silty clay and silty clay loam lakebed sediments

This association is on a glacial lakebed. It is mainly nearly level, but in spots it is gently sloping. Dug ditches, all of which drain into Aux Sable Creek, provide drainage outlets for this area.

This association makes up about 14 percent of the county. It is about 31 percent Swygert soils, 29 percent Bryce soils, 19 percent Martinton soils, and 14 percent the minor Milford soils and 7 percent the minor Nappanee, Del Rey, and Sawmill soils.

Swygert and Martinton soils are somewhat poorly drained, but Bryce soils are in lower areas and are poorly drained. All these soils formed in lakebed sediments, but Swygert and Bryce soils formed in silty clay sediment and Martinton soils in silty clay loam sediment. The Swygert and Bryce soils have a surface layer of silty clay loam, a subsoil of silty clay, and underlying material of silty clay. The Martinton soils have a surface layer of silt loam and a subsoil of silty clay loam and silty clay over stratified dominantly silty clay and silty clay loam. All of these soils have moderately slow to very slow permeability.

Of the minor soils, Milford and Sawmill soils are in the lower areas and are poorly drained; Del Rey and Nappanee soils are somewhat poorly drained. Nappanee soils formed in silty clay lakebed sediments, and Milford and Del Rey soils formed in silty clay loam lakebed sediments.

The soils of this association are well suited to intensive cropping. Corn and soybeans are the main crops. Bryce and Milford soils and some areas of Swygert soils need artificial drainage. Shallow surface drains should be used instead of tile in most places. In many places tiles are used in conjunction with surface inlets to drain low-lying areas where water tends to accumulate. Many deep ditches in the area serve as drainage outlets.

Descriptions of the Soils

This section describes the soil series and mapping units in Kendall County. Each soil series is described in detail, and then, briefly, each mapping unit in that series. Unless specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any

one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. The profile described in the series is representative of mapping units in that series. If the profile of a given mapping unit is different from the one described for the series, these differences are stated in describing the mapping unit, or they are differences that are apparent in the name of the mapping unit. Color terms are for moist soil unless otherwise stated.

As mentioned in the section "How This Survey Was Made," not all mapping units are members of a soil series. Gravel pits, for example, does not belong to a soil series but, nevertheless, is listed in alphabetic order along with the soil series.

Some soil names are not identical to those used in adjacent counties. These differences are caused by variations in slope, composition of mapping units, and changes in soil classification.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the management group in which the mapping unit has been placed. The management group, tree planting group, and wildlife group for each soil can be learned by referring to the "Guide to Mapping Units" at the back of this survey.

The approximate acreage and proportionate extent of each mapping unit are shown in table 3. Many of the terms used in describing soils can be found in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*6*).

TABLE 3.—*Approximate acreage and proportionate extent of the soils*

Soil	Area	Extent	Soil	Area	Extent
	Acres	*Percent*		*Acres*	*Percent*
Barrington silt loam, 0 to 2 percent slopes	1,600	0.8	Mundelein silt loam	7,620	3.7
Barrington silt loam, 2 to 4 percent slopes	1,310	.6	Nappanee silt loam, 0 to 2 percent slopes	250	.1
Barrington silt loam, 4 to 7 percent slopes, eroded	620	.3	Nappanee silt loam, 2 to 4 percent slopes	140	.1
Batavia silt loam, 0 to 2 percent slopes	840	.4	Peotone silty clay loam	2,030	1.0
Batavia silt loam, 2 to 4 percent slopes	390	.2	Plano silt loam, 0 to 2 percent slopes	8,960	4.4
Brenton silt loam	7,100	3.5	Plano silt loam, 2 to 4 percent slopes	1,640	.8
Brenton silt loam, bedrock substratum	170	.1	Plano silt loam, 4 to 7 percent slopes, eroded	230	.1
Bryce silty clay	8,540	4.2	Plattville silt loam, 0 to 2 percent slopes	1,820	.9
Camden silt loam, 1 to 4 percent slopes	900	.4	Plattville silt loam, 2 to 4 percent slopes	540	.3
Camden silt loam, 4 to 7 percent slopes, eroded	560	.3	Proctor silt loam, 0 to 2 percent slopes	2,270	1.1
Camden silt loam, 7 to 12 percent slopes, eroded	240	.1	Proctor silt loam, 2 to 4 percent slopes	2,200	1.1
Cut and fill land	640	.3	Proctor silt loam, 4 to 7 percent slopes, eroded	280	.1
Del Rey silt loam	580	.3	Ripon silt loam, 1 to 4 percent slopes	350	.2
Dodge silt loam, 0 to 2 percent slopes	830	.4	Ripon silt loam, 4 to 7 percent slopes, eroded	100	(1)
Dodge silt loam, 2 to 4 percent slopes	2,110	1.1	Rush silt loam, 0 to 2 percent slopes	1,290	.6
Dodge silt loam, 4 to 7 percent slopes, eroded	500	.2	Rush silt loam, 2 to 4 percent slopes	550	.3
Dresden silt loam, 0 to 2 percent slopes	1,630	.8	St. Charles silt loam, 0 to 2 percent slopes	1,340	.7
Dresden silt loam, 2 to 4 percent slopes	2,900	1.4	St. Charles silt loam, 2 to 4 percent slopes	890	.4
Drummer silty clay loam	35,190	17.2	St. Charles silt loam, 4 to 7 percent slopes, eroded	240	.1
DuPage loam	1,350	.6	Sawmill silty clay loam	2,810	1.4
Elburn silt loam	6,820	3.2	Saybrook silt loam, 0 to 2 percent slopes	3,150	1.5
Fox silt loam, 1 to 4 percent slopes	1,120	.5	Saybrook silt loam, 2 to 4 percent slopes	19,930	9.8
Fox silt loam, 4 to 7 percent slopes, eroded	920	.4	Saybrook silt loam, 2 to 4 percent slopes, eroded	2,760	1.3
Gravel pits	660	.4	Saybrook silt loam, 4 to 7 percent slopes, eroded	4,330	2.1
Harpster silty clay loam	1,050	.5	Sparta loamy fine sand, 3 to 10 percent slopes	90	(1)
Hennepin silt loam, 15 to 30 percent slopes	1,120	.5	Strawn silt loam, 4 to 7 percent slopes	570	.3
Hennepin silt loam, 30 to 45 percent slopes	380	.2	Strawn silt loam, 4 to 7 percent slopes, eroded	1,700	.8
Houghton muck	680	.3	Strawn silt loam, 7 to 15 percent slopes, eroded	1,260	.6
Kendall silt loam	360	.2	Strawn silt loam, 15 to 30 percent slopes	200	.1
Knight silt loam	380	.2	Strawn soils, 4 to 7 percent slopes, severely eroded	250	.1
Landes fine sandy loam	480	.2	Strawn soils, 7 to 12 percent slopes, severely eroded	740	.3
La Rose silt loam, 2 to 4 percent slopes, eroded	620	.3	Swygert silty clay loam, 0 to 2 percent slopes	7,380	3.6
La Rose silt loam, 4 to 7 percent slopes, eroded	5,700	2.8	Swygert silty clay loam, 2 to 4 percent slopes	1,220	.6
La Rose soils, 4 to 7 percent slopes, severely eroded	1,780	.9	Swygert silty clay loam, 3 to 7 percent slopes, eroded	360	.2
La Rose soils, 7 to 12 percent slopes, severely eroded	1,600	.8	Thorp silt loam	910	.4
Lena muck	330	.2	Varna silt loam, 1 to 4 percent slopes	200	.1
Lisbon silt loam	9,270	4.6	Varna silt loam, 4 to 7 percent slopes, eroded	360	.2
Lorenzo loam, 4 to 7 percent slopes	440	.2	Varna soils, 7 to 15 percent slopes, severely eroded	150	.1
Lorenzo loam, 7 to 18 percent slopes, eroded	540	.3	Virgil silt loam	380	.2
Lorenzo loam, 18 to 40 percent slopes	1,010	.5	Waupecan silt loam, 0 to 2 percent slopes	6,230	3.1
Martinton silt loam, 0 to 2 percent slopes	4,140	2.0	Waupecan silt loam, 2 to 4 percent slopes	400	.2
Martinton silt loam, 2 to 4 percent slopes	760	.4	Water	1,200	.6
Milford silty clay loam	4,130	2.0	Quarries	120	(1)
Milford silty clay loam, bedrock substratum	320	.2			
Millbrook silt loam	780	.4	Total	204,800	100.0
Millington silt loam	1,970	1.0			

[1] Less than 0.05 percent.

Barrington Series

The Barrington series consists of nearly level to moderately sloping, moderately well drained and well drained soils. These soils are on higher positions in areas of glacial outwash in the eastern part of the county. They formed in thin deposits of silt loam material and in the underlying stratified loamy glacial outwash. The native vegetation was prairie grasses.

In a representative profile the surface layer is black and very dark grayish-brown silt loam about 13 inches thick. The subsoil, about 31 inches thick, is brown and yellowish brown. The upper 15 inches is silty clay loam, and the lower 16 inches is clay loam that grades to stratified sandy loam and silt loam. The underlying material is stratified silt loam, sandy loam, and loamy sand that has some gravel. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Barrington soils are well suited to all the commonly grown crops. Most areas are farmed intensively to corn and soybeans. Increasing the organic-matter content and protecting the gently sloping and moderately sloping soils from erosion are the major concerns of management.

Representative profile of Barrington silt loam, 0 to 2 percent slopes, 36 feet east of road center and 190 feet south of east-west fence, in the NW¼SW¼NW¼ sec. 35, T. 36 N., R. 8 E.

Ap—0 to 8 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A3—8 to 13 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine and medium, granular structure; friable; slightly acid; clear, smooth boundary.

B21t—13 to 21 inches, brown (10YR 5/3) silty clay loam; moderate, very fine, subangular blocky structure; continuous thin coatings of very dark gray (10YR 3/1); firm; slightly acid; clear, smooth boundary.

B22t—21 to 28 inches, brown (10YR 5/3) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, faint, grayish-brown (10YR 5/2) mottles; moderate, very fine and fine, subangular blocky structure; continuous thin coatings of dark grayish brown (10YR 4/2); firm; neutral; clear, smooth boundary.

IIB23t—28 to 32 inches, yellowish-brown (10YR 5/4) clay loam; many, medium, faint, yellowish-brown (10YR 5/6) mottles and few, fine, distinct, grayish-brown (10YR 5/2) mottles; moderate, medium, subangular blocky structure; thin coatings of dark grayish brown (10YR 4/2) on vertical ped faces; firm; mildly alkaline; clear, wavy boundary.

IIB3—32 to 44 inches, mixed brown (10YR 5/3) and yellowish-brown (10YR 5/6) stratified sandy loam and silt loam; weak, medium and coarse, subangular blocky structure; dark grayish-brown (10YR 4/2) material in lower 3 inches; friable; moderately alkaline; strong effervescence; gradual, wavy boundary.

IIC—44 to 66 inches, mixed yellowish-brown (10YR 5/6) and grayish-brown (10YR 5/2) stratified silt loam, sandy loam, and loamy sand that contains some gravel; structureless; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 15 inches in thickness and is black to dark brown. The B2 horizon ranges from silty clay loam to clay loam, and the B3 horizon from silty clay loam that has a gritty feel and clay loam to loam or sandy loam. The solum ranges from 36 to 50 inches in thickness. The C horizon has variable thicknesses of silt loam, loam, sandy loam, loamy sand, and gravelly loam.

Barrington soils are associated with Mundelein and Drummer soils. They have better natural drainage than Mundelein and Drummer soils, and they contain less clay in the A horizon than Drummer soils. Barrington soils are similar to Proctor soils but have carbonates at less depth.

Barrington silt loam, 0 to 2 percent slopes (443A).—This soil is at a somewhat higher elevation than the surrounding level areas of outwash. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Mundelein silt loam and areas where the subsoil has a higher content of sand than is typical for Barrington soils. Also included are small areas where calcareous glacial till is at a depth of 40 to 60 inches.

This soil is suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Barrington silt loam, 2 to 4 percent slopes (443B).—This soil commonly is on small rises that are surrounded by other nearly level soils. It has a profile similar to the one described as representative of the series, but the surface layer is thinner.

Included with this soil in mapping are small areas of Mundelein silt loam and areas where the subsoil has a higher content of sand than is typical for Barrington soils. Other inclusions are small areas where calcareous glacial till is at a depth of 40 to 60 inches. Also included are areas where some subsoil material has been mixed with the surface layer and areas where the subsoil is not mottled.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard, but the size of the areas and the irregular topography limit the use of some practices that control erosion. Where practical, such erosion control practices as contouring and minimum tillage reduce soil losses. Management group IIe-1.

Barrington silt loam, 4 to 7 percent slopes, eroded (443C2).—This soil is in areas of outwash in the eastern part of the county. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas where calcareous glacial till is at a depth of 40 to 60 inches and areas where the subsoil is not mottled.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard if the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Batavia Series

The Batavia series consists of nearly level to gently sloping, well drained and moderately well drained soils. These soils are on broad ridges and side slopes near the major drainageways in the northwestern part of the county, mainly in areas that are transitional between St. Charles and Plano soils. The Batavia soils formed in moderately thick deposits of silt loam material and in the underlying sandy loam till or stratified loamy glacial outwash. The native vegetation was mixed prairie grasses and hardwood trees.

In a representative profile the surface layer is very dark grayish-brown silt loam about 8 inches thick. The subsurface layer, about 7 inches thick, is dark-brown silt loam. The subsoil is about 33 inches thick. The upper part of the subsoil is dark-brown silty clay loam, and the lower part is yellowish-brown silty clay loam and clay loam. The underlying material is mixed dark yellowish-brown, brown, and yellowish-brown stratified silt loam and fine sandy loam. It is moderately alkaline glacial drift.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Batavia soils are well suited to all the commonly grown crops, and most areas are farmed intensively and used for corn and soybeans. Increasing the organic-matter content and protecting the gently sloping soils from erosion are the major concerns of management.

Representative profile of Batavia silt loam, 2 to 4 percent slopes, 45 feet north of road center and 165 feet east of private drive, in the SW¼SW¼SE¼SE¼ sec. 16, T. 35 N., R. 6 E.

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine to medium, granular structure; friable; neutral; abrupt, smooth boundary.

A2—8 to 15 inches, dark-brown (10YR 4/3) silt loam; moderate, fine, platy structure; friable; medium acid; clear, smooth boundary.

B21t—15 to 18 inches, dark-brown (10YR 4/3) light silty clay loam; moderate, fine, subangular blocky structure; thin coatings of brown (10YR 5/3) silt on ped surfaces; friable; medium acid; clear, smooth boundary.

B22t—18 to 34 inches, dark-brown (10YR 4/3) silty clay loam; moderate, fine, subangular blocky structure; coatings of dark yellowish brown (10YR 3/4); firm; medium acid; clear, smooth boundary.

B23t—34 to 40 inches, yellowish-brown (10YR 5/4) silty clay loam; few, fine, faint, yellowish-brown (10YR 5/6) mottles; moderate, fine and medium, subangular blocky structure; thin coatings of dark yellowish brown (10YR 4/4) on peds; firm; slightly acid; clear, smooth boundary.

IIB3—40 to 48 inches, yellowish-brown (10YR 5/4) light clay loam; moderate, fine and medium, subangular blocky structure; thin coatings of dark yellowish brown (10YR 4/4) on peds; firm; slightly acid; clear, smooth boundary.

IIC—48 to 70 inches, mixed dark yellowish-brown (10YR 4/4), brown (10YR 5/3), and yellowish-brown (10YR 5/6) stratified silt loam and fine sandy loam; massive and single grained; friable; neutral to moderately alkaline; strong effervescence in lower part.

The A horizon ranges from 8 to 16 inches in thickness. The A1 horizon is very dark brown to dark grayish brown, and the A2 horizon is dark brown to brown. The upper part of the B horizon ranges from dark brown to yellowish brown; the lower part ranges from yellowish brown to reddish brown and, in some places, is mottled. The IIB horizon ranges from clay loam to sandy loam. The solum ranges from 45 to more than 60 inches in thickness. The underlying material, in some places stratified, has variable textures of fine sandy loam, silt loam, loam, sand, and in some places, gravel.

Batavia soils occur on the same landscape with Virgil, St. Charles, and Plano soils. Batavia soils are better drained than Virgil soils. They have a darker colored A horizon than St. Charles soils and a lighter colored A horizon than Plano soils.

Batavia silt loam, 0 to 2 percent slopes (105A).—This soil is in somewhat elongated areas that parallel large drainageways. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thicker.

Included with this soil in mapping are small areas of Virgil silt loam and St. Charles silt loam, 0 to 2 percent slopes. Also included are small areas where the lower part of the subsoil is mottled.

This soil is well suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Batavia silt loam, 2 to 4 percent slopes (105B).—This soil is on broad ridges that are somewhat elongated. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Batavia silt loam, 0 to 2 percent slopes, and St. Charles silt loam, 2 to 4 percent slopes. Also included are areas where the surface layer is thinner than the one in this soil and areas where the lower part of the subsoil is mottled.

This soil is suited to the crops commonly grown. Erosion is a hazard, but the size of the areas and the irregular topography limit the use of erosion control practices. Management group IIe-1.

Brenton Series

The Brenton series consists of nearly level, somewhat poorly drained soils. These soils are in areas of glacial outwash. They formed in thin deposits of silt loam material and in the underlying stratified loam, silt loam, sandy loam, and loamy sand glacial outwash. The native vegetation was prairie grasses.

In a representative profile the surface layer is black to very dark gray silt loam about 15 inches thick. The subsoil is about 35 inches thick. In sequence from the top, it is dark grayish-brown to a depth of 20 inches, grayish brown between depths of 20 and 35 inches, and brown to a depth of 50 inches. Yellowish-brown mottles are larger and brighter with increasing depth. The texture to a depth of 41 inches is silty clay loam that has sand grains noticeable at a depth of 28 inches. Below a depth of 41 inches, the subsoil is clay loam. The underlying material is mixed grayish-brown and yellowish-brown stratified sandy loam, silt loam, and sand. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high. Most areas are farmed intensively and used for corn and soybeans. Brenton soils are also well suited to the other commonly grown crops. Some areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Brenton silt loam, 80 feet east and 2,610 feet south of the northwest corner of sec. 30, T. 36 N., R. 7 E.

Ap—0 to 8 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; mildly alkaline; abrupt, smooth boundary.

A12—8 to 12 inches, black (10YR 2/1) silt loam; moderate, fine to medium, granular structure; friable; neutral; clear, smooth boundary.

A13—12 to 15 inches, very dark gray (10YR 3/1) silt loam; moderate, medium, granular structure; friable; slightly acid; clear, smooth boundary.

B21t—15 to 20 inches, dark grayish-brown (10YR 4/2) silty clay loam; common, fine, distinct, yellowish-brown (10YR 5/4) mottles; moderate, fine and very fine, subangular blocky structure; very dark gray (10YR 3/1) krotovinas in upper part of horizon; firm; slightly acid; clear, smooth boundary.

B22t—20 to 28 inches, grayish-brown (10YR 5/2) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, very fine, subangular blocky structure; continuous coatings of dark grayish brown (10YR 4/2) on ped surfaces; firm; slightly acid; clear, smooth boundary.

IIB23t—28 to 35 inches, grayish-brown (10YR 5/2) silty clay loam that contains a noticeable amount of sand; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; coatings of dark grayish brown (10YR 4/2) on ped surfaces; firm; slightly acid; clear, smooth boundary.

IIB31t—35 to 41 inches, brown (10YR 5/3) silty clay loam that contains a noticeable amount of sand; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; coatings of dark grayish brown (10YR 4/2) on vertical ped surfaces; firm; slightly acid; clear, smooth boundary.

IIB32t—41 to 50 inches, brown (10YR 5/3) and yellowish-brown (10YR 5/6) clay loam; weak, medium, subangular blocky structure to structureless; coatings of dark grayish brown (10YR 4/2) on vertical ped surfaces; friable; mildly alkaline; clear, smooth boundary.

IIC—50 to 62 inches, grayish-brown (10YR 5/2) and yellowish-brown (10YR 5/6) stratified sand, silt loam, and sandy loam; single grained and massive; friable; moderately alkaline; slight effervescence.

The A horizon ranges from 10 to 17 inches in thickness. It is black to very dark gray silt loam to light silty clay loam. The B2 horizon is mainly silty clay loam, but the lower part ranges to clay loam. The B3 horizon ranges from silty clay loam that has a gritty feel and clay loam to loam. In most places the solum ranges from 40 to 55 inches in thickness. The C horizon has variable thicknesses of sandy loam, silt loam, sand, and in some places gravel.

Brenton soils are associated with Drummer, Proctor, and Millbrook soils. They have drainage similar to that of Martinton, Mundelein, and Elburn soils. Brenton soils are better drained than Drummer soils, but they are not so well drained as Proctor soils. They are darker colored than Millbrook soils and do not have an A2 horizon, which is characteristic of Millbrook soils. Brenton soils contain less clay throughout the solum than Martinton soils, have carbonates at a greater depth than Mundelein soils, and have more sand between depths of 30 and 40 inches than Elburn soils.

Brenton silt loam (0 to 2 percent slopes) (149).—This soil is in irregularly shaped areas that are somewhat higher in elevation than the surrounding nearly leve lareas. It has the profile described as representative of the series. Where this soil occurs with Waupecan soils, it is in a low-lying position on the landscape and is underlain by sand and gravel at a depth of 55 to 70 inches.

Included with this soil in mapping are small areas of Drummer silty clay loam and Proctor silt loam, 0 to 2 percent slopes. Also included are small areas where calcareous glacial till is at a depth of 40 to 60 inches.

This soil is very well suited to crops commonly grown in the county. A periodic high water table is the most serious limitation to the use of this soil. Where needed, tile drains and shallow surface ditches improve drainage. Management group I-2.

Brenton silt loam, bedrock substratum (0 to 2 percent slopes) (R149).—This soil is in irregularly shaped areas that are somewhat lower in elevation than the Plattville soils around it. It has a profile similar to the one described as representative of the series, but limestone bedrock is at a depth of 48 to 60 inches.

Included with this soil in mapping are small areas of soils that are more poorly drained than this Brenton soil. Also included are small areas of Brenton silt loam and Plattville silt loam, 0 to 2 percent slopes.

This soil is well suited to crops commonly grown in the county. A periodic high water table is the most serious limitation to the use of this soil. Where outlets are available, tile drains improve drainage. Management group I-2.

Bryce Series

The Bryce series consists of nearly level, poorly drained soils. These soils are at a low elevation in areas of glacial lakebeds in the southeastern part of the county. They formed in heavy-textured lakebed sediments. The native vegetation was prairie grasses that were adapted to swampy areas.

In a representative profile the surface layer is black silty clay about 12 inches thick. The subsoil, about 38 inches thick, is dark-gray and gray silty clay that has yellowish-brown mottles. The underlying material is mixed greenish-gray and yellowish-brown silty clay. It is stratified, strongly alkaline lakebed sediments.

Permeability is slow, and the available water capacity is high. The organic-matter content is high. Most Bryce soils are farmed intensively and used for corn and soybeans. They are well suited to most crops, including legumes and pasture plants. Many areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Bryce silty clay, 72 feet west of road center and 21 feet south of fence, in the NE¼NE¼ NE¼SE¼ sec. 29, T. 35 N., R. 8 E.

A1—0 to 12 inches, black (N 2/0) silty clay; moderate, fine, granular structure; firm; slightly acid; clear, smooth boundary.

B1g—12 to 15 inches, dark-gray (5Y 4/1) silty clay; moderate, very fine to fine, subangular blocky structure; continuous coatings of black (5Y 2/1) on peds; firm; slightly acid; clear, smooth boundary.

B21g—15 to 25 inches, dark-gray (5Y 4/1) heavy silty clay; many, fine, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings of black (5Y 2/1) and very dark gray (5Y 3/1) on peds; very firm; neutral; clear, smooth boundary.

B22g—25 to 32 inches, gray (5Y 5/1) silty clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, fine and medium, angular blocky; coatings of dark gray (5Y 4/1) and very dark gray (5Y 3/1) on peds; very firm; mildly alkaline; clear, wavy boundary.

B3g—32 to 50 inches, gray (5Y 5/1) silty clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of dark gray (5Y 4/1) on peds; very dark gray (5Y 3/1) krotovinas terminate at a depth of 50 inches; firm; moderately alkaline; slight effervescence; clear, smooth boundary.

C—50 to 62 inches, mixed greenish-gray (5GY 5/1) and yellowish-brown (10YR 5/4) silty clay; massive; strongly alkaline; strong effervescence.

The A horizon ranges from 10 to 18 inches in thickness and is heavy silty clay loam to heavy silty clay. The B horizon ranges from silty clay to clay and in places has layers of silty clay loam in the lower part. In most places the solum ranges from 40 to 52 inches in thickness. The C horizon is mixed gray, greenish-gray, and yellowish-brown stratified silty clay, silty clay loam, and, in some places, thin layers of silt loam and sand.

Bryce soils are associated with the somewhat poorly drained Swygert soils. Bryce soils contain more clay throughout the profile than Milford soils that also occur in the glacial lakebed area of the county.

Bryce silty clay (0 to 2 percent slopes) (235).—This soil is in broad, irregularly shaped areas.

Included with this soil in mapping are small areas of Swygert silty clay loam, 0 to 2 percent slopes; Milford silty clay loam; and overwash material. Included wet areas, calcareous areas, and gray spots are shown on the detailed soil map by the conventional symbols.

A seasonal high water table, slow permeability, and fine texture are the most serious limitations to the use of this soil. Runoff is slow or ponded. Artificial drainage is needed to lower the water table and remove ponded water. Management group IIw-3.

Camden Series

The Camden series consists of gently sloping to strongly sloping, well drained and moderately well drained soils. These soils are on ridgetops and side slopes in the more rolling areas of glacial outwash. They formed in thin deposits of silt loam material and in the underlying stratified silt loam, sandy loam, loam, and sand glacial outwash. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is dark-gray silt loam about 8 inches thick. The subsurface layer is brown silt loam about 6 inches thick. The subsoil, about 49 inches thick, is yellowish-brown silty clay loam in the upper 22 inches and brown to yellowish-brown silty clay loam that

has a gritty feel and silt loam in the lower 27 inches. The underlying material is light yellowish-brown stratified sand and silt. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low. Most of the gently sloping and moderately sloping Camden soils are cultivated. These soils are suited to all the commonly grown crops. Increasing the organic-matter content and controlling erosion are the major concerns of management. Many of the strongly sloping areas are used for pasture or woodland.

Representative profile of Camden silt loam, 1 to 4 percent slopes, 126 feet south of road fence and 190 feet east of north-south road center, in the NW¼NW¼NE¼ sec. 3, T. 36 N., R. 6 E.

Ap—0 to 8 inches, dark-gray (10YR 4/1) silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A2—8 to 14 inches, brown (10YR 5/3) silt loam that has dark-gray (10YR 4/1) stains; weak, fine, subangular blocky structure; friable; neutral; clear, smooth boundary.

B1t—14 to 18 inches, yellowish-brown (10YR 5/4) light silty clay loam; moderate, fine and very fine, subangular blocky structure; continuous coatings of dark yellowish brown (10YR 4/4) on peds; friable; neutral; clear, smooth boundary.

B21t—18 to 27 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine, subangular blocky structure; continuous coatings of dark yellowish brown (10YR 3/4) on peds; firm; slightly acid; gradual, smooth boundary.

IIB22t—27 to 36 inches, yellowish-brown (10YR 5/6) silty clay loam that has a noticeable sand content; moderate, fine, prismatic structure parting to moderate, fine to medium, subangular blocky; continuous coatings of dark brown (10YR 3/3) on peds; firm; slightly acid; clear, smooth boundary.

IIB23t—36 to 47 inches, brown to yellowish-brown (10YR 5/3 to 5/6) silty clay loam that contains a noticeable amount of sand; moderate, medium, prismatic structure partint to moderate, medium, subangular blocky; continuous coatings of very dark gray to dark brown (10YR 3/1 to 3/3) on peds; firm; neutral; clear, smooth boundary.

IIB3—47 to 63 inches, brown (10YR 5/3) heavy silt loam that has thin layers of sand; moderate, coarse, prismatic structure parting to weak, medium to coarse, subangular blocky; coatings of dark brown (7.5YR 4/2) on vertical ped surfaces; friable; moderately alkaline; slight effervescence; clear, smooth boundary.

IIC—63 to 72 inches, light yellowish-brown (10YR 6/4) stratified sand and silt; single grained; moderately alkaline; strong effervescence.

The A horizon ranges from 8 to 15 inches in thickness. In plowed areas the Ap horizon ranges from dark gray to dark brown. The A2 horizon ranges from dark grayish brown to brown. The B2 horizon ranges from silty clay loam to clay loam, and the B3 horizon ranges from silty clay loam that has a gritty feel and clay loam to silt loam or loam. The solum ranges from 40 to more than 60 inches in thickness. The C horizon has variable thicknesses of silt loam, sandy loam, sand, and in some places, gravel.

The Camden soils in this county have a IIB horizon that contains less sand than is within the defined range for the series. This difference does not alter the usefulness and behavior of these soils.

Camden soils are near Millbrook and St. Charles soils. They are better drained and have a lighter colored A horizon than Millbook soils. Between depths of 30 and 40 inches they have more sand than St. Charles soils.

Camden silt loam, 1 to 4 percent slopes (134B).—This soil is on small ridges or in narrow strips in rolling areas of glacial outwash, mainly along the major streams. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of St. Charles silt loam and areas where the surface layer is darker colored than is typical for Camden soils. Also included are small areas of soils that are more poorly drained than this Camden soil.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard, but the size of the areas and the irregular topography limit the use of erosion control practices. Where practical, erosion control practices and minimum tillage reduce erosion. Management group IIe-1.

Camden silt loam, 4 to 7 percent slopes, eroded (134C2).—This soil is in outwash areas along the major streams. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas of St. Charles silt loam and areas where the surface layer is darker colored than is typical for Camden soils. Also included are small areas of soils that are more poorly drained than this Camden soil. Other inclusions are small areas of soils that are not stratified in the lower part of the subsoil or in the underlying material.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard if the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Camden silt loam, 7 to 12 percent slopes, eroded (134D2).—This soil is on side slopes of outwash areas where they face drainageways or bottom lands. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas of soils that are not stratified in the lower part of the subsoil and in the underlying material and areas of soils that contain more gravel than the soil described as representative of the Camden series.

These soils are suited to pasture, woodland, and cropping that is not intensive. Controlling erosion is a necessary part of management. Erosion control practices that are suited to the topography should be used if this soil is cropped. Management group IIIe-1.

Cut and Fill Land

Cut and fill land (C.F.) consists of areas of many variations of disturbed soil. The areas are mainly the result of man-made cutting and filling or land leveling. Most of these areas are now used for roads, industry, and urban development. Not placed in a management group.

Del Rey Series

The Del Rey series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils are along Aux Sable Creek in the glacial lakebed area of the county. They formed mainly in silty clay loam lakebed sediment. The native vegetation was hardwood trees.

In a representative profile the surface layer is very dark gray silt loam about 4 inches thick. The subsurface layer is dark-gray and grayish-brown silt loam about 6 inches thick. The subsoil is about 26 inches thick. The upper 3 inches is brown light silty clay loam, the middle 7 inches is grayish-brown silty clay, and the lower 16 inches is grayish-brown and yellowish-brown silty clay loam. Mottles occur throughout the subsoil. The underlying material is mixed yellowish-brown and gray, stratified silty clay, silt loam, and sandy loam.

Permeability is slow, and the available water capacity is

high. The organic-matter content is low. Del Rey soils are well suited to all the commonly grown crops. Many areas are cropped along with the surrounding Martinton and Milford soils; others are in woodland and pasture. Some areas need additional drainage if they are to be cultivated early in spring.

Representative profile of Del Rey silt loam, 0 to 3 percent slopes, 105 feet west and 103 feet north of the northwest corner of concrete block building, in the SW¼NW¼SW¼ NW¼ sec. 15, T. 35 N., R. 6 E.

A1—0 to 4 inches, very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate, fine, granular structure; friable; neutral; clear, smooth boundary.

A21—4 to 6 inches, dark-gray (10YR 4/1) silt loam; moderate, medium, platy structure parting to weak, fine, granular; friable; slightly acid; clear, smooth boundary.

A22—6 to 10 inches, grayish-brown (10YR 5/2) silt loam; common, fine, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, platy structure parting to very fine subangular blocky; friable; medium acid; clear, smooth boundary.

B21t—10 to 13 inches, brown (10YR 5/3) light silty clay loam; common, fine, distinct, grayish-brown (2.5Y 5/2) mottles; moderate, very fine, subangular blocky structure; firm; strongly acid; clear, smooth boundary.

B22t—13 to 20 inches, grayish-brown (2.5Y 5/2) silty clay; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, prismatic structure parting to strong, fine, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) to very dark gray (10YR 3/1) on ped surfaces; firm; strongly acid; clear, smooth boundary.

B23t—20 to 30 inches, grayish-grown (2.5Y 5/2) heavy silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to strong, fine and medium, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) on ped surfaces; firm; medium acid; clear, wavy boundary.

B3—30 to 36 inches, grayish-brown (2.5Y 5/2) and yellowish-brown (10YR 5/8) silty clay loam; moderate, medium, prismatic structure parting to moderate, medium and coarse, subangular blocky; very dark gray (10YR 3/1) coatings vertically throughout horizon; firm; mildly alkaline; clear, wavy boundary.

C—36 to 52 inches, mixed strata of yellowish-brown (10YR 5/6) and gray (5Y 5/1) silt loam, sandy loam, and silty clay; weak, coarse, subangular blocky structure and massive; moderately alkaline; strong effervescence.

The A horizon ranges from 8 to 13 inches in thickness. In many areas that have been disturbed by plowing, the A2 horizon is lacking. The B and C horizons are mainly silty clay loam but they have a lesser amount of silty clay; the C horizon has some coarser textured material. Mottles of grayish brown and yellowish brown are larger and more distinct in the lower part of the B horizon. In most places the solum ranges from 30 to 50 inches in thickness. In many areas sand and gravel strata are at a depth of 6 to 8 feet.

Del Rey soils are associated with Martinton and Milford soils. They are lighter colored than Martinton and Milford soils and are better drained than Milford soils.

Del Rey silt loam (0 to 2 percent slopes) (192).—This soil is in somewhat elongated areas that parallel Aux Sable Creek in the glacial lakebed area of the county.

Included with this soil in mapping are small areas of a soil that has a darker colored surface layer and small areas of Nappanee silt loam, 0 to 2 percent slopes.

This soil is suited to the crops commonly grown in the county. Slow permeability, a seasonal high water table, and low organic-matter content are limitations to the use of this soil. Management group IIw-4.

Dodge Series

The Dodge series consists of nearly level to moderately sloping, well-drained soils. These soils are on irregularly shaped ridges in the more rolling morainal areas. They formed in thin deposits of silt loam material and in the underlying silt loam and loam glacial till. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is dark grayish-brown silt loam about 6 inches thick. The subsurface layer is grayish-brown silt loam about 5 inches thick. The subsoil, about 24 inches thick, is yellowish-brown silty clay loam and clay loam in the upper 20 inches and light yellowish-brown loam in the lower 4 inches. The underlying material is light yellowish-brown loam. It is moderately alkaline glacial till.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low. Most large areas of Dodge soils have been cleared and cultivated, but the smaller areas are in pasture or woodland. The soils are well suited to all the commonly grown crops. Maintaining good tilth, increasing the organic-matter content, and protecting the gently sloping and moderately sloping soils from erosion are the major concerns of management.

Representative profile of Dodge silt loam, 0 to 2 percent slopes, 31 feet west and 1,240 feet south of the northeast corner of sec. 11, T. 36 N., R. 7 E.

Ap—0 to 6 inches, dark grayish-brown (10YR 4/2) silt loam; weak, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A2—6 to 11 inches, grayish-brown (10YR 5/2) silt loam; weak, thin, platy structure parting to weak, fine, granular; friable; medium acid; clear, smooth boundary.

B21t—11 to 15 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine, subangular blocky structure; firm; strongly acid; clear, smooth boundary.

B22t—15 to 22 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine and very fine, subangular blocky structure; coatings of dark brown (10YR 4/3) on peds; firm; strongly acid; clear, smooth boundary.

B23t—22 to 27 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine, subangular blocky structure; coatings of very dark grayish brown (10YR 3/2) on peds; firm; slightly acid; clear, wavy boundary.

IIB24t—27 to 31 inches, yellowish-brown (10YR 5/6) clay loam; weak, medium, subangular blocky structure; discontinuous coatings of dark brown (10YR 4/3) on vertical ped surfaces; firm; mildly alkaline; clear, wavy boundary.

IIB3—31 to 35 inches, light yellowish-brown (10YR 6/4) heavy loam; weak, medium and coarse, subangular blocky structure; friable; moderately alkaline; slight effervescence; gradual, wavy boundary.

IIC—35 to 50 inches, light yellowish-brown (10YR 6/4) heavy loam; massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 5 to 13 inches in thickness, which is variable because of erosion that has taken place. It ranges from grayish brown to very dark grayish brown. In some areas that have been disturbed by plowing the A2 horizon is lacking. The B2 horizon ranges from brown to yellowish brown and in many places is mottled in the lower part. The IIB3 horizon ranges from loam to clay loam in texture and from 4 to 12 inches in thickness. In most places the solum ranges from 28 to 45 inches in thickness. The C horizon ranges from silt loam to loam.

Dodge soils are associated with Strawn and Saybrook soils. They have a thicker solum than Strawn soils and lack a dark-colored A horizon, which is typical of Saybrook soils.

Dodge silt loam, 0 to 2 percent slopes (24A).—This soil is on the larger, more nearly level ridgetops in the more rolling morainal parts of the county. It has the profile described as representative of the series.

Included with this soil in mapping are small areas where the surface layer is thicker and darker colored than is typical for Dodge soils and small areas where the glacial till is deeper than is typical.

This soil is suited to the crops commonly grown in the

county. It can be cropped intensively. Management group I-1.

Dodge silt loam, 2 to 4 percent slopes (24B).—This soil is on ridgetops in the more rolling morainal parts of the county.

Included with this soil in mapping are small areas where the surface layer is thicker and darker colored than is typical for Dodge soils and small areas where the glacial till is deeper than is typical. Also included are small areas where subsoil material is mixed with the surface layer. In the southeastern corner of Bristol Township are areas of included soils that have a finer textured subsoil than is typical of Dodge soils.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard, but the size of the areas and the irregular topography limit the use of some erosion control practices. Where they are practical, such erosion control practices as contouring and minimum tillage reduce soil loss. Management group IIe-1.

Dodge silt loam, 4 to 7 percent slopes, eroded (24C2).—This soil is in the more rolling morainal parts of the county. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material in the surface layer.

Included with this soil in mapping are small areas of Strawn silt loam, 4 to 7 percent slopes, eroded, and small areas where the surface layer consists almost entirely of subsoil material. In the southeastern corner of Bristol Township are areas of included soils that have a finer textured subsoil than is typical of Dodge soils.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard if the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Dresden Series

The Dresden series consists of nearly level to gently sloping, well-drained soils. These soils are in the glacial outwash areas of the Fox River Valley. They formed in thin deposits of silt loam material and in the underlying sand and gravel. The native vegetation was mixed prairie grasses and hardwood trees.

In a representative profile the surface layer is very dark grayish-brown silt loam about 8 inches thick. The subsoil, about 19 inches thick, is dark-brown silty clay loam in the upper 9 inches and dark-brown clay loam in the lower 10 inches. The underlying material is dark yellowish-brown and light-gray, stratified, moderately alkaline sand and gravel.

Permeability is moderate in the solum and rapid in the underlying material. The available water capacity and the organic-matter content are moderate. Dresden soils are suited to all the commonly grown crops. Most areas are farmed intensively. Increasing the organic-matter content and the available water capacity are the major concerns of management.

Representative profile of Dresden silt loam, 2 to 4 percent slopes, 159 feet east of quarter mile line fence and 75 feet northwest of west-northwest angling fence, in the NW¼ SE¼NW¼ sec. 25, T. 37 N., R. 7 E.

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; medium acid; abrupt, smooth boundary.

B21t—8 to 11 inches, dark-brown (10YR 4/3) silty clay loam; weak, fine, subangular blocky structure; coatings of very dark grayish brown (10YR 3/2) on vertical ped surfaces; firm; medium acid; clear, smooth boundary.

B22t—11 to 17 inches, dark-brown (10YR /3) silty clay loam; moderate, fine and very fine, subangular blocky structure; coatings of dark brown (10YR 3/3) on peds; firm; medium acid; clear, smooth boundary.

IIB3t—17 to 27 inches, dark-brown (7.5YR 4/4) clay loam; fine subangular blocky structure; coatings of dark brown (7.5YR 3/2) on peds; firm; slightly acid; pebbles throughout; clear, wavy boundary.

IIC—27 to 47 inches, dark yellowish-brown (10YR 4/4) and light-gray (10YR 7/2) sand and gravel; single grained; moderately alkaline; strong effervescence.

The A horizon ranges from 7 to 14 inches in thickness. In plowed areas it ranges from very dark grayish brown to very dark brown. Where present, the A2 horizon ranges from dark grayish brown to brown. The upper part of the B horizon ranges from dark brown to brown. The IIB horizon ranges from dark-brown to reddish-brown clay loam to gravelly loam. The solum ranges from 24 to 40 inches in thickness. The underlying material is made up of variable thicknesses of calcareous sand and gravel.

Dresden soils are on the same landscape with Fox, Lorenzo, and Rush soils. They have a darker colored A horizon than Fox soils. They have a thicker solum than Lorenzo soils and a thinner solum than Rush soils.

Dresden silt loam, 0 to 2 percent slopes (325A).—This soil is in irregularly shaped areas that are at a somewhat higher elevation than the surrounding soils. It has a profile similar to the one described as representative of the series, but the surface layer is thicker.

Included with this soil in mapping are areas of soils that have a darker colored surface layer than is typical of Dresden soils and small areas of Waupecan silt loam, 0 to 2 percent slopes.

This soil is well suited to the crops commonly grown in the county. It can be cropped intensively. Management group IIs-1.

Dresden silt loam, 2 to 4 percent slopes (325B).—This soil is on somewhat elongated ridges or on the sides of drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Dresden silt loam, 0 to 2 percent slopes, and areas where the surface layer is thicker than is typical of the Dresden series. Also included are small areas of eroded soils.

This soil is suited to the crops commonly grown in the county. If erosion is controlled and the available water capacity is increased, the soil can be cropped intensively. Management group IIs-1.

Drummer Series

The Drummer series consists of nearly level, poorly drained soils. These soils are in areas of glacial outwash in the county and in low-lying positions of the morainal areas. They formed in deposits of silt loam material and in the underlying stratified loam, silt loam, sandy loam, and sand glacial till or outwash. The native vegetation was prairie grasses that were adapted to swampy areas.

In a representative profile the surface layer is black silty clay loam about 12 inches thick. The subsoil is about 38 inches thick and is a mixture of grayish brown, gray, yellowish brown, and other colors. The upper 29 inches is silty clay loam, and the lower 9 inches is clay loam, loam, and sandy loam. The underlying material is mixed yellowish-brown and gray stratified sandy loam and loam. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high. Most areas of Drummer soils are farmed intensively to corn and soybeans. They are well suited to the other commonly grown crops. Many areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Drummer silty clay loam, 120 feet north of road culvert and 36 feet east of road center, in the NW¼SW¼SE¼ sec. 29, T. 36 N., R. 7 E.

Ap—0 to 8 inches, black (N 2/0) silty clay loam; moderate, fine, granular structure; friable; mildly alkaline; abrupt, smooth boundary.

A3—8 to 12 inches, black (N 2/0) silty clay loam; moderate, fine and medium, granular structure; friable; mildly alkaline; clear, smooth boundary.

B21g—12 to 20 inches, grayish-brown (2.5Y 5/2) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/4) mottles; weak, medium, prismatic structure parting to moderate, very fine, subangular blocky; continuous coatings of very dark gray (5Y 3/1) on peds; firm; neutral; clear, smooth boundary.

B22g—20 to 28 inches, gray (5Y 5/1) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine, subangular blocky; discontinuous coatings of very dark gray (2.5Y 3/0) on peds; firm; neutral; clear, smooth boundary.

B23g—28 to 41 inches, gray (5Y 5/1) silty clay loam that has a high content of sand in the lower part; many, fine, prominent, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, medium, subangular blocky, coatings of very dark gray (10YR 3/1) on vertical ped surfaces; firm; neutral; abrupt, smooth boundary.

IIB3g—41 to 50 inches, mixed gray (5Y 5/1) and yellowish-brown (10YR 5/8) stratified clay loam, sandy loam, and loam that contains many stones and pebbles; weak, coarse, prismatic structure; patchy coatings of very dark gray (10YR 3/1) on vertical ped surfaces; friable; slightly alkaline to moderately alkaline; slight effervescence; gradual, smooth boundary.

IIC—50 to 58 inches, mixed yellowish-brown (10YR 5/6) and gray (5Y 5/1) stratified sandy loam and loam that contains many stones and gravel; single grained and massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 12 to 18 inches in thickness. The B2 horizon is mainly silty clay loam, but the lower part ranges to clay loam that in many places is mildly alkaline. This horizon ranges from dark grayish brown to gray, and the yellowish-brown colors increase with increasing depth. The B3 horizon ranges from silty clay loam that has a gritty feel to sandy loam and in many places is stratified. In most places the solum ranges from 44 to 55 inches in thickness. The C horizon ranges from heavy silt loam or loam glacial till to stratified sandy loam, gravelly loam, and silt loam glacial outwash.

Drummer soils are associated with Brenton, Mundelein, Lisbon, and Elburn soils. They differ from these soils in being more poorly drained and having more clay in the A horizon.

Drummer silty clay loam (0 to 2 percent slopes) (152).—This soil is mainly in broad, irregularly shaped areas, but to a lesser extent, it is in narrow drainageways.

Included with this soil in mapping are areas where free carbonates are at a depth of less than 40 inches. These areas occur where Drummer soils are associated with Mundelein soils. Also included are small areas of Milford soils and small areas of silty overwash. Wet areas that are less than 2 acres in size are shown on the detailed soil map by the conventional symbol.

A seasonal high water table is a serious limitation to the use of this soil. Runoff is slow or ponded. Tile drains and shallow surface ditches improve drainage. Management group IIw-1.

DuPage Series

The DuPage series consists of nearly level, moderately well drained soils. These soils are on bottom lands, mainly along Big Rock and Little Rock Creeks. They formed in water-laid silt loam, loam, and sandy loam.

In a representative profile the surface layer consists of two parts. The upper part is very dark grayish-brown loam about 13 inches thick. The lower part, about 15 inches thick, is very dark grayish-brown loam. The underlying material is brown, calcareous sandy loam.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high. Where practical to cultivate, DuPage soils are suited to corn and soybeans. Most areas are in pasture or woodland because of the small size of the areas and the meanderings of the stream.

Representative profile of DuPage loam, 340 feet southeast of rock culvert and 45 feet southwest of road center, in the NW¼SW¼SW¼ sec. 26, T. 37 N., R. 6 E.

A11—0 to 13 inches, very dark grayish-brown (10YR 3/2) loam that has a high content of sand and contains many broken snail shells; weak, fine, granular structure; friable; moderately alkaline; strong effervescence; clear, smooth boundary.

A12—13 to 28 inches, very dark grayish-brown (10YR 3/2) loam; common, medium, distinct, dark-brown (7.5YR 4/3) mottles in lower 6 inches; weak, medium, subangular blocky structure parting to moderate, medium, granular; coatings of very dark gray (10YR 3/1) on peds; friable; moderately alkaline; violent effervescence; many snail shells; clear, smooth boundary.

C1—28 to 38 inches, brown (10YR 4/3) sandy loam; weak, medium and coarse, subangular blocky structure or massive; friable; moderately alkaline; strong effervescence; many snail shells; clear, smooth boundary.

C2—38 to 50 inches, brown (10YR 5/3) sandy loam; single grained; friable; moderately alkaline; strong effervescence; many snail shells.

The A horizon ranges from black to very dark grayish brown, and it has some dark brown in the lower part. It is silt loam or loam and is only mildly alkaline in some places. Concentrations of broken snail shells vary. In many areas the solum is free of mottles. The C horizon ranges from sandy loam to loamy gravel or loamy sand.

DuPage soils occur with Millington and Landes soils on the flood plains of the Fox River and Little and Big Rock Creeks. DuPage soils have brighter colors in all horizons and are better drained than Millington soils. They are finer textured than Landes soils and are calcareous.

DuPage loam (0 to 2 percent slopes) (321).—This soil is on bottom lands that are narrow and bordered by steep side slopes.

Included with this soil in mapping are small areas of soils that are poorly drained and soils that have a thinner surface layer than is typical of DuPage soil. Small areas of recent sandy overwash are also included.

Many areas of this soil are small and are dissected by meandering streams. They are also subject to occasional flooding; consequently, this soil is used mainly as woodland and pasture. It is suited to the common cultivated crops where the access to and size of the fields permit tillage operations. Management group I-1.

Elburn Series

The Elburn series consists of nearly level, somewhat poorly drained soils. These soils are on the lower parts of the landscape in broad, level areas in the northwestern and central parts of the county. They formed in moderately thick deposits of silt loam material and in the underlying sandy

loam till or stratified loamy glacial outwash. The native vegetation was prairie grasses.

In a representative profile the surface layer is black silt loam about 13 inches thick. The subsoil is about 35 inches thick. In sequence from the top, it is 7 inches of dark grayish-brown silty clay loam, 21 inches of grayish-brown silty clay loam, and 7 inches of light brownish-gray silt loam. The yellowish-brown mottles that are in the subsoil indicate a fluctuating water table. The underlying material is mixed gray and yellowish-brown stratified silt loam and sandy loam. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high. Elburn soils are well suited to all the commonly grown crops. Most areas are farmed intensively and are used for corn and soybeans. Some areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Elburn silt loam, 39 feet east of road center and 15 feet south of gatepost across road, in the NW¼NW¼SW¼NW¼ sec. 7, T. 36 N., R. 6 E.

Ap—0 to 9 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A12—9 to 13 inches, black (10YR 2/1) silt loam; moderate, very fine to fine, granular structure; friable; neutral; clear, smooth boundary.

B1t—13 to 15 inches, dark grayish-brown (10YR 4/2) light silty clay loam; moderate, very fine, subangular blocky structure; many black iron stains on peds; firm; slightly acid; clear, smooth boundary.

B21t—15 to 20 inches, dark grayish-brown (10YR 4/2) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/4, 5/6) mottles; moderate, very fine and fine, subangular blocky structure; continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; slightly acid; clear, smooth boundary.

B22t—20 to 30 inches, grayish-brown (10YR 5/2) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) and light brownish-gray (10YR 6/2) mottles; weak, medium, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

B23t—30 to 41 inches, grayish-brown (10YR 5/2) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) and light brownish-gray (10YR 6/2) mottles; weak, medium, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; neutral; clear, smooth boundary.

IIB3—41 to 48 inches, light brownish-gray (10YR 6/2) silt loam that has a noticeable content of sand; common, fine, faint, yellowish-brown (10YR 5/4) mottles; weak, medium, prismatic structure parting to weak, coarse, subangular blocky; coatings of very dark grayish brown (10YR 3/2) on vertical ped faces; friable; moderately alkaline; slight effervescence; clear, smooth boundary.

IIC—48 to 64 inches, mixed gray (5Y 5/1) and yellowish-brown (10YR 5/6) stratified silt loam and sandy loam; single grained and massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 17 inches in thickness. It is black to very dark gray silt loam to light silty clay loam. The B horizon ranges from dark grayish brown to brown and is mottled. Below a depth of 41 inches the B horizon ranges from silty clay loam to clay loam, silt loam, and sandy clay loam. The solum ranges from 45 to more than 60 inches in thickness. The underlying material, which is stratified in places, has variable textures of sandy loam, silt loam, loam, sand, and in some places, gravel.

Elburn soils are associated with Plano and Drummer soils and are similar to Brenton soils. They are more poorly drained than Plano soils and are better drained than Drummer soils. They contain less sand above a depth of 40 inches than Brenton soils.

Elburn silt loam (0 to 2 percent slopes) **(198)**.—This soil is in irregularly shaped areas that are at a somewhat lower elevation than the surrounding nearly level soils.

Included with this soil in mapping are small areas of Drummer silty clay loam and Plano silt loam, 0 to 2 percent slopes. Also included are small areas where the surface layer and subsoil are less than 45 inches thick.

A periodic high water table is the most serious limitation to the use of this soil. This condition can be improved by installing artificial drainage. Management group I-2.

Fox Series

The Fox series consists of nearly level to moderately sloping, well-drained soils. These soils are in the glacial outwash areas near the breaks to the Fox River and Blackberry Creek. They formed in thin layer of silt loam material and in the underlying sand and gravel. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsurface layer, about 6 inches thick, is grayish-brown and brown silt loam. In areas that have not been disturbed by plowing the surface layer is thinner and darker. The subsoil is yellowish-brown silty clay loam in the upper 12 inches and dark-brown heavy clay loam in the lower 8 inches. The underlying material is yellowish-brown, moderately alkaline sand and gravel.

Permeability is moderate in the solum and rapid in the underlying material. The available water capacity is moderate, and the organic-matter content is low. Fox soils are suited to all the commonly grown crops. Many of the larger areas are cultivated, but many areas adjacent to drainageways and steep breaks are in pasture or woodland. Increasing the organic-matter content and controlling erosion are the major concerns of management.

Representative profile of Fox silt loam, 1 to 4 percent slopes, 110 feet north of road center and 210 feet west of north-south fence, in the NE¼SE¼NE¼ sec. 36, T. 37 N., R. 6 E.

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; weak, very fine, granular structure; friable; mildly alkaline; abrupt, smooth boundary.

A2—7 to 13 inches, grayish-brown (10YR 5/2) silt loam that is brown (10YR 5/3) in the lower 3 inches; weak, medium, platy structure parting to weak, very fine, subangular blocky; stains of very dark gray (10YR 3/1) on peds; friable; neutral; clear, smooth boundary.

B21t—13 to 19 inches, yellowish-brown (10YR 5/4) light silty clay loam; moderate, fine and medium, subangular blocky structure; patchy stains of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

B22t—19 to 25 inches, yellowish-brown (10YR 5/6) silty clay loam; weak, medium, prismatic structure parting to strong, medium, subangular blocky; thin continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

IIB3t—25 to 33 inches, dark-brown (7.5YR 4/4) heavy clay loam; moderate, coarse, prismatic structure parting to strong, coarse, subangular blocky; continuous coatings of dark brown (7.5YR 3/2) on peds; firm; mildly alkaline; pebbles throughout; gradual, smooth boundary.

IIC—33 to 40 inches, yellowish-brown (10YR 5/4) sand and gravel; single grained; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 7 to 14 inches in thickness. In uncultivated areas it is very dark gray to black, and where mixed with the A2 horizon, it is dark grayish brown. The upper part of the B horizon ranges from yellowish brown to brown and dark brown. The lower part of the B horizon ranges from dark-brown to reddish-brown clay loam to gravelly loam. The solum ranges from 24 to 40 inches in thickness. The underlying material is variable thicknesses of calcareous sand and gravel.

Fox soils occur on the same landscape with Dresden, Lorenzo, and Rush soils. They have a lighter colored A horizon than Dresden soils. They are also lighter colored and have a thicker solum than Lorenzo soils. Fox soils have a thinner solum than Rush soils.

Fox silt loam, 1 to 4 percent slopes (327B).—This soil is on somewhat elongated ridges or in areas that parallel steep breaks of the major drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Rush silt loam, 0 to 2 percent slopes, and small eroded areas.

This soil is suited to the crops commonly grown in the county. If the soil is well managed, it can be cropped intensively. Management group IIs-1.

Fox silt loam, 4 to 7 percent slopes, eroded (327C2).—This soil is on elongated ridges or in areas that parallel steep breaks of the major drainageways.

Included with this soil in mapping are small areas of Fox silt loam, 1 to 4 percent slopes, and soils that have a thinner surface layer and subsoil than is typical of Fox soils.

This soil is only moderately well suited to the commonly grown crops. It is subject to severe erosion if cropped intensively. Erosion control practices and good management are necessary for continued cropping. Management group IIIs-1.

Gravel Pits

Gravel pits (G.P.) consists of areas where gravel and sand have been excavated or mined. Most gravel pits are in the valley of the Fox River where the gravel deposits occur. Some pits are permanently filled with water and are used as fishponds. Not placed in a management group.

Harpster Series

The Harpster series consists of nearly level, poorly drained to very poorly drained soils. These soils are in areas of glacial lakebeds throughout the country, except for the southeastern part. They formed in thin deposits of silt loam material and in the underlying stratified sandy loam, silt loam, sand, and gravelly glacial drift. The native vegetation was prairie grasses that were adapted to swampy areas.

In a representative profile the surface layer is black and very dark gray silty clay loam about 14 inches thick. The lower part of the surface layer is strongly alkaline. The subsoil is about 32 inches thick. In sequence from the top, it is 9 inches of gray and light-gray silty clay loam, 9 inches of olive-gray silty clay loam, and 14 inches of olive-gray clay loam. The underlying material is olive-gray loam. All horizons are calcareous or moderately alkaline to strongly alkaline.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high. Most Harpster soils are farmed intensively and used for corn and soybeans. If fertilization is balanced for calcareous soils, they are well suited to all the commonly grown crops. Many areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Harpster silty clay loam, 70 feet south of section line and 175 feet west of north-south fence line, in the NW¼NE¼NW¼ sec. 31, T. 37 N., R. 8 E.

Ap—0 to 8 inches, black (N 2/0) silty clay loam; moderate, fine and medium, granular structure; firm; moderately alkaline; strong effervescence; abrupt, smooth boundary.

A12ca—8 to 14 inches, very dark gray (2.5Y 3/0) silty clay loam; moderate, fine and medium, granular structure; firm; strongly alkaline; violent effervescence; clear, smooth boundary.

B21g—14 to 19 inches, gray (5Y 5/1) silty clay loam; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; firm; moderately alkaline; strong effervescence; abrupt, smooth boundary.

B22gca—19 to 23 inches, gray (5Y 5/1) and light-gray (5Y 7/1) silty clay loam; moderate, medium, prismatic structure parting to weak, fine, subangular blocky; firm; strongly alkaline; clear, smooth boundary.

B31g—23 to 32 inches, olive-gray (5Y 4/2) silty clay loam that has a noticeable content of sand; weak, medium, prismatic structure parting to weak, medium, subangular blocky; firm; moderately alkaline; strong effervescence; gradual, smooth boundary.

IIB32g—32 to 46 inches, olive-gray (5Y 4/2) clay loam; weak, coarse, prismatic structure parting to weak, medium, subangular blocky; moderately alkaline; strong effervescence; gradual, wavy boundary.

IIC-46 to 56 inches, olive-gray (5Y 5/2) loam; common, medium, prominent, olive-brown (2.5Y 4/4) mottles; weak, coarse, subangular blocky structure and massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 12 to 18 inches in thickness and from heavy silt loam to heavy silty clay loam in texture. The B2 horizon ranges from gray to grayish-brown heavy silty clay loam to clay loam. The B3 horizon is silty clay loam, clay loam, loam, and sandy loam. In most places the solum ranges from 36 to 50 inches in thickness. The C horizon ranges from heavy silt loam or loam to stratified sandy loam, silt loam, and sand.

Harpster soils are associated with Drummer and Peotone soils. They differ from those soils in that they are calcareous throughout the solum.

Harpster silty clay loam (0 to 2 percent slopes) (67).—This soil is in depressions that occur as irregularly shaped areas of Drummer silty clay loam.

Included with this soil in mapping are small areas that are not calcareous at the surface. Also included are areas of soils that have a finer textured surface layer and subsoil than is typical of Harpster soils. Wet areas that are less than 2 acres in size are shown on the detailed soil map by the conventional symbol.

This soil is well suited to the crops commonly grown in the county. A seasonal high water table and low fertility are limitations to the use of this soil. Runoff is slow or ponded. Tile drains and shallow surface ditches improve drainage. Management group IIw-1.

Hennepin Series

The Hennepin series consists of steep to very steep, well-drained soils. These soils are on steep breaks along the major streams in areas of glacial moraines. They formed in thin deposits of silt loam material and in the underlying gravelly loam, loam, and silt loam glacial drift. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is very dark grayish-brown silt loam about 4 inches thick. The subsoil, about 10 inches thick, is brown, moderately alkaline gravelly silt loam. The underlying material is yellowish-brown gravelly loam. It is moderately alkaline glacial drift.

Permeability and the available water capacity are moderate. The organic-matter content is low. Most areas of Hennepin soils are in woodland or pasture and are too steep to be used for row crops.

Representative profile of Hennepin silt loam, 15 to 30 percent slopes, 1,110 feet west and 980 feet north of the southeast corner of NE¼ sec. 2, T. 36 N., R. 6 E.

A1—0 to 4 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; common pebbles and stones; mildly alkaline; clear, smooth boundary.
B2—4 to 14 inches, brown (10YR 4/3) gravelly silt loam; moderate, fine to medium, subangular blocky structure; thin coatings of clay on peds; friable to firm; common pebbles and stones; moderately alkaline; slight effervescence; clear, wavy boundary.
C1—14 to 18 inches, yellowish-brown (10YR 5/4) gravelly loam; weak, coarse, subangular blocky structure; friable; moderately alkaline; strong effervescence; clear, smooth boundary.
C2—18 to 50 inches, yellowish-brown (10YR 5/4) gravelly loam; massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 2 to 6 inches in thickness. It is very dark grayish-brown to brown silt loam to light loam. The B horizon ranges from brown to yellowish-brown silt loam to gravelly loam. In most places the solum is less than 15 inches thick. The C horizon is gravelly loam, silt loam, loam, or sandy loam and in many places is stratified.

Hennepin soils are associated with St. Charles and Strawn soils. They occur on steep breaks in areas of St. Charles soils. Hennepin soils have a thinner solum than the Strawn and St. Charles soils.

Hennepin silt loam, 15 to 30 percent slopes (25F).—This soil is in long, narrow breaks along the valleys of major streams and rivers. It has the profile described as representative of the series.

Included with this soil in mapping are a few areas of Strawn silt loam and small areas of soils that are more gravelly and sandy than this Hennepin soil. Also included are small areas where slopes are less than 15 percent and severely eroded areas.

This soil is suited to pasture or woodland. Erosion is a serious concern of management for any use. Management group VI.

Hennepin silt loam, 30 to 45 percent slopes (25G).—This soil is on sharp, long, narrow breaks along the valleys of major streams and rivers.

Included with this soil in mapping are areas of soils that have a higher content of sand and gravel than is typical of Hennepin soils. Also included are severely eroded areas.

This soil is suited to woodland. Erosion is a serious concern of management. Management group VII.

Houghton Series

The Houghton series consists of nearly level to depressional, very poorly drained organic soils. These soils are on the low-lying parts of the landscape in depressions on the moraines, or in glacial outwash channels (fig. 6). The soils formed in fibrous plant remains in swampy areas. The native vegetation was reeds, sedges, and swamp grasses.

In a representative profile the surface layer, about 14 inches thick, is black organic material mixed with about 40 percent mineral soil. The next two layers contain more organic material, mainly decomposed aquatic plants. The black muck is about 54 inches thick. The underlying material, of unknown depth, is also organic.

Permeability is moderately rapid, and the available water capacity and organic-matter content are very high. If adequately drained and properly fertilized, Houghton soils are suited to corn and soybeans. Areas too wet to cultivate are used for pasture or wildlife.

Representative profile of Houghton muck, 40 feet west of culvert and 35 feet north of road center, in the SE¼SW¼-NE¼ sec. 26, T. 37 N., R. 8 E.

Oa1—0 to 14 inches, black (N 2/0), broken faced and rubbed, sapric material; less than 5 percent fiber, a trace rubbed; about 40 percent mineral soil; weak, medium, granular structure; neutral; gradual, smooth boundary.
Oa2—14 to 35 inches, black (N 2/0) broken faced and rubbed, sapric material; 5 to 10 percent fiber, a trace rubbed; massive; neutral; gradual, smooth boundary.
Oa3—35 to 54 inches, black (N 2/0) broken faced and rubbed, sapric material; about 10 percent fiber, a trace rubbed; massive; neutral.

Figure 6.—**Dark area is Houghton muck, in a former glacial outwash channel.**

The recent overwash is 0 to 8 inches thick. Large areas of Houghton soils have very little overwash. Hemic or undecomposed layers are only a small part of any profile and are variable in occurrence. One large area is underlain by marl.

Houghton soils are similar to Lena soils but are not calcareous.

Houghton muck (103).—This soil is in depressions that were formerly swamps. Areas that are still swampy are indicated on the soil map by the conventional symbol.

Included with this soil in mapping are a large area in the southeastern corner of Bristol Township and an area in the northeastern corner of Kendall Township that are underlain by marl. Also included are areas where the organic layer is thinner than the one in this soil and areas where there is no overwash material.

This soil has limited suitability for crops. Where the soil is adequately drained and fertilized, corn and soybeans do well. Undrained areas are used for pasture or wildlife. Management group IIIw-1.

Kendall Series

The Kendall series consists of nearly level, somewhat poorly drained soils. These soils are on level parts of the landscape in the northwestern part of the county, mainly on the east and north sides of creeks where the native woodland vegetation was protected from prairie fires. They formed in moderately thick deposits of silt loam material and in the underlying loam or sandy loam till or stratified loamy glacial outwash. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is dark grayish-brown silt loam about 7 inches thick. The subsurface layer, about 5 inches thick, is brown silt loam that has grayish-brown and yellowish-brown mottles. In areas undisturbed by plowing, the surface layer is thinner and darker. The subsoil, about 53 inches thick, is brown and yellowish brown and has grayish-brown and yellowish-brown mottles. It is silty clay loam in the upper 28 inches and silt loam and clay loam

in the lower 25 inches. The underlying material is dark-brown loam and yellowish-brown sandy loam. It is moderately alkaline glacial drift.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low. Kendall soils are suited to all the commonly grown crops. Most areas are cultivated, but many small areas are in pasture or woodland. Increasing the organic-matter content and providing drainage where needed are the major concerns of management.

Representative profile of Kendall silt loam, 440 feet west of angle in fence and 36 feet south of field fence, in the NW¼SE¼NE¼ sec. 5, T. 37 N., R. 6 E.

Ap—0 to 7 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, fine, granular structure; friable; slightly acid; abrupt, smooth boundary.

A2—7 to 12 inches, brown (10YR 5/3) silt loam; few, fine, faint, grayish-brown (10YR 5/2) mottles and common, fine, faint, yellowish-brown (10YR 5/4) mottles; weak, thin, platy structure parting to moderate, fine, granular; friable; strongly acid; clear, smooth boundary.

B1—12 to 16 inches, brown (10YR 5/3) light silty clay loam; many, fine, faint, yellowish-brown (10YR 5/6) mottles; moderate, very fine and fine, subangular blocky structure; continuous coatings of grayish brown (10YR 5/2) on peds; friable; strongly acid; clear, smooth boundary.

B21t—16 to 26 inches, brown (10YR 5/3) silty clay loam; many, medium, faint, grayish-brown (10YR 5/2) mottles and many, fine, faint, yellowish-brown (10YR 5/6) mottles; moderate, fine, prismatic structure parting to strong, fine and medium, subangular blocky; continuous coatings of grayish brown (10YR 5/2) on peds; firm; strongly acid; gradual, smooth boundary.

B22t—26 to 40 inches, yellowish-brown (10YR 5/4) silty clay loam; many, medium, faint, grayish-brown (10YR 5/2) mottles and many, fine, faint, yellowish-brown (10YR 5/8) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of dark grayish brown (10YR 4/2) on peds; firm; strongly acid; clear, smooth boundary.

B31—40 to 51 inches, mixed yellowish-brown (10YR 5/6) and grayish-brown (10YR 5/2) heavy silt loam; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; friable; medium acid; small very dark grayish-brown (10YR 3/2) krotovinas; clear, smooth boundary.

IIB32—51 to 65 inches, dark yellowish-brown (10YR 4/4) light clay loam; weak, coarse, subangular blocky structure; friable; neutral; clear, smooth boundary.

IIIC1—65 to 69 inches, dark-brown (10YR 4/3) loam that contains many till pebbles; structureless; friable; moderately alkaline; slight effervescence; clear, smooth boundary.

IIIC2—69 to 72 inches, yellowish-brown (10YR 5/4) sandy loam; many, fine, faint, yellowish-brown (10YR 5/6) mottles; massive and single grained; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 15 inches in thickness. The A1 horizon is grayish brown to dark grayish brown. The A2 horizon is pale brown, grayish brown, or brown. The B horizon is mainly silty clay loam above a depth of 40 inches but ranges to clay loam, sandy loam, or loam below. Mottles of light browhish gray to yellowish brown are variable throughout the B horizon. The solum ranges from 45 to more than 60 inches in thickness. The underlying material has variable textures of sandy loam, silt loam, loam, and in some places gravel.

Kendall soils are associated with Batavia, St. Charles, and Virgil soils. They are more poorly drained than Batavia and St. Charles soils and are lighter colored than Virgil soils.

Kendall silt loam (0 to 2 percent slopes) (242).—This soil is in irregularly shaped areas that are at a somewhat lower elevation than the surrounding soils.

Included with this soil in mapping are small areas of Virgil silt loam and St. Charles silt loam, 0 to 2 percent slopes. Also included are small areas of more poorly drained soils in depressions.

A periodic high water table and low organic-matter content are the most serious limitations to the use of this soil. In many places drainage is required for good management where this soil is used for cultivated crops. Management group I-2.

Knight Series

The Knight series consists of nearly level to depressional, poorly drained soils. These soils are in the northwestern part of the county. They formed in moderately thick deposits of silt loam material and in the underlying stratified loam and sandy loam glacial drift. The native vegetation was prairie grasses that were adapted to wet areas.

In a representative profile the surface layer is black and very dark gray silt loam about 24 inches thick. The subsurface layer, about 13 inches thick, is dark-gray and gray silt loam. The upper part of the subsoil is about 20 inches of gray silty clay loam. The lower part of the subsoil, about 15 inches thick, is dark-gray clay loam. The underlying material is brown stratified loam and sandy loam.

Permeability is moderately slow, and the available water capacity is high. The organic-matter content is high. If adequately drained, Knight soils are suited to the commonly grown crops. Maintaining adequate drainage with tile and shallow surface ditches is the major concern of management.

Representative profile of Knight silt loam, 68 feet north and 116 feet east of center, of sec. 6, T. 37 N., R. 7 E.

Ap—0 to 10 inches, black (10YR 2/1) silt loam; moderate, fine and medium, granular structure; friable; slightly acid; abrupt, smooth boundary.

A12—10 to 18 inches, black (N 2/0) silt loam; moderate, medium, granular structure; friable; slightly acid; clear, wavy boundary.

A13—18 to 24 inches, very dark gray (10YR 3/1) silt loam; weak, very fine, subangular blocky structure; friable; medium acid; clear, wavy boundary.

A21—24 to 29 inches, dark-gray (10YR 4/1) silt loam; weak, very fine, subangular blocky structure; friable; strongly acid; clear, smooth boundary.

A22—29 to 37 inches, gray (5Y 5/1) silt loam; few, fine, yellowish-brown (10YR 5/8) mottles; moderate, very fine and fine, subangular blocky structure; thin grayish-brown (2.5Y 5/2) stains; friable; strongly acid; clear, smooth boundary.

B21tg—37 to 45 inches, gray (5Y 6/1) silty clay loam; few, fine, prominent, yellowish-brown (10YR 5/8) and pale-brown (10YR 6/3) mottles; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; thin discontinuous films of dark-gray (5Y 4/1) clay on peds and around root channels; firm; strongly acid; clear, smooth boundary.

B22tg—45 to 57 inches, gray (5Y 5/1) silty clay loam; few, fine, prominent, yellowish-brown (10YR 5/8) mottles; moderate, coarse, prismatic structure parting to moderate, medium, angular blocky; thin discontinuous films of dark-gray (5Y 4/1) clay on peds and around root channels; firm; medium acid; clear, smooth boundary.

IIB23tg—57 to 72 inches, dark-gray (5Y 4/1) clay loam; many, medium, prominent, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; firm; few, small, black (10YR 2/1) krotovinas; slightly acid; clear, smooth boundary.

IIC—72 to 75 inches, brown (10YR 5/3) stratified loam and sandy loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles and common, medium, faint, grayish-brown (10YR 5/2) mottles; massive; loose; moderately alkaline; strong effervescence.

The Ap and A1 horizons range from 12 to more than 24 inches in thickness. The A2 horizon ranges from 12 to more than 16 inches in thickness. The B horizon ranges from gray to grayish brown and has a variable amount of yellowish-brown mottles. The solum ranges from 50 to 80 inches in thickness. In most places the underlying material is stratified and ranges from loam to sand or gravel.

Knight soils are associated with Elburn and Plano soils, but they are not so well drained. Knight soils also occur near Thorp soils, but they have a thicker A horizon than those soils.

Knight silt loam (0 to 2 percent slopes) (191).—This soil is in depressions that are in areas where the topography is relatively flat.

Included with this soil in mapping are small areas where the surface layer is thinner than is typical of Knight soil. Also included are small areas of Thorp silt loam.

This soil is suited to the crops commonly grown in the county. It can be cropped intensively. A high water table and the hazard of ponding are the major concerns of management. Management group IIw-1.

Landes Series

The Landes series consists of nearly level, moderately well drained soils. These soils are on bottom lands along the lower part of Little Rock Creek. They formed in water-laid sandy sediments.

In a representative profile the surface layer, to a depth of 27 inches, is very dark gray and black fine sandy loam and has thin layers of dark grayish-brown loamy sand. Below this it is very dark gray loamy fine sand about 10 inches thick. The upper part of the underlying material, about 20 inches thick, is dark yellowish-brown loamy fine sand that has grayish-brown mottles. Below this is mixed light brownish-gray fine sand and dark-gray loamy fine sand.

Permeability is rapid, and the available water capacity is low. The organic-matter content is medium to low. Landes soils are better suited to pasture or woodland than to other uses. The areas are severely cut up by the meandering stream and recently deposited bars of sand and gravel.

Representative profile of Landes fine sandy loam, 47 feet north and 60 feet east of the southwest corner of the SE¼ sec. 29, T. 37 N., R. 6 E.

A11—0 to 16 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, subangular blocky structure parting to weak, very fine to fine, granular; loose; mildly alkaline; clear, smooth boundary.

A12—16 to 27 inches, black (10YR 2/1) fine sandy loam that contains thin strata of dark grayish-brown (10YR 4/2) loamy sand; weak, fine and medium, subangular blocky structure; loose; mildly alkaline; clear, smooth boundary.

A13—27 to 37 inches, very dark gray (10YR 3/1) loamy fine sand; weak, coarse, subangular blocky structure; loose; mildly alkaline; clear, smooth boundary.

C1—37 to 57 inches, dark yellowish-brown (10YR 4/4) loamy fine sand; many, coarse, distinct, grayish-brown (10YR 5/2) mottles, mainly in lower 6 inches; very weak, coarse, subangular blocky structure; loose; mildly alkaline; clear, smooth boundary.

C2—57 to 67 inches, light brownish-gray (10YR 6/2) fine sand; many, coarse, distinct, yellowish-brown (10YR 5/6) mottles; structureless; loose; mildly alkaline; clear, smooth boundary.

C3—67 to 75 inches, dark-gray (10YR 4/1) loamy fine sand; single grained; loose; moderately alkaline; strong effervescence.

The A horizon is very dark gray and black and contains thin layers of dark grayish brown. It is mainly fine sandy loam stratified with loamy sand, fine gravel, or sand. The C horizon has variable textures of loamy fine sand, or sand with fine gravel in some areas.

Landes soils occur on the flood plain of Little Rock Creek with DuPage soils. They are coarser textured throughout the profile than DuPage soils.

Landes fine sandy loam (0 to 2 percent slopes) (304).—This soil is on cut-up, rough bottom lands. It is in small, irregularly shaped areas as a result of the meandering stream. The areas are bordered by steep side slopes.

Included with this soil in mapping are small areas of moderately alkaline silt loam. Also included are areas of sandy and gravelly overwash.

This soil is better suited to trees or pasture than to other uses, but it can be used for small grains. Management group IIIs-1.

La Rose Series

The La Rose series consists of gently sloping to strongly sloping, well-drained soils. These soils occur in morainal areas of rolling relief along with Saybrook soils. La Rose soils formed in very thin deposits of silt loam material and in the underlying silt loam and loam glacial till. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark grayish-brown silt loam about 8 inches thick. The subsoil is about 16 inches thick. The upper part is dark yellowish-brown silty clay loam, and the lower part is brown heavy silt loam. The underlying material is brown heavy silt loam that has a high content of sand. It is moderately alkaline glacial till.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. La Rose soils are suited to all the commonly grown crops. Protecting the soils from erosion and increasing the organic-matter content are the major concerns of management.

Representative profile of La Rose silt loam, 4 to 7 percent slopes, eroded, 1,080 feet south and 155 feet east of northwest corner of sec. 14, T. 36 N., R. 6 E.

Ap—0 to 8 inches, very dark grayish-brown (10YR 3/2) heavy silt loam; strong, medium, granular structure; firm; neutral; few till pebbles; clear, smooth boundary.

B2t—8 to 16 inches, dark yellowish-brown (10YR 4/4) silty clay loam that has a noticeable content of sand; moderate, medium, prismatic structure parting to strong, very fine and fine, subangular blocky; continuous coatings of very dark grayish brown (10YR 3/2) on peds; few till pebbles; firm; neutral; clear, wavy boundary.

B3—16 to 24 inches, brown (10YR 5/3) heavy silt loam that has a noticeable content of sand; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; discontinuous coatings of dark grayish brown (10YR 4/2) on peds; many till pebbles; firm; mildly alkaline; gradual, wavy boundary.

C—24 to 51 inches, brown (10YR 5/3) heavy silt loam that has a noticeable content of sand; many, medium, faint, yellowish-brown (10YR 5/6) mottles; weak, coarse, subangular blocky structure and massive; friable; many pebbles; moderately alkaline; strong effervescence.

The A horizon ranges from 8 to 12 inches in thickness and is very dark grayish brown or black. The B horizon ranges from silty clay loam or clay loam to loam or silt loam in the lower part. In most places the solum ranges from 12 to 26 inches in thickness. The C horizon is silt loam or loam that contains varying amounts of glacial stones and boulders.

In Kendall County the La Rose soils have Bt and C horizons that contain less sand than is within the defined range for the series. This difference does not alter the usefulness and behavior of these soils.

La Rose soils are associated with Saybrook and Varna soils. They have a thinner solum than Saybrook soils, and they contain less clay in the B and C horizons than Varna soils.

La Rose silt loam, 2 to 4 percent slopes, eroded (60B2).—This soil is on small, irregularly shaped ridgetops and on the short side slopes of ridges. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas of Saybrook silt loam, 2 to 4 percent slopes, eroded. Also included are small areas where the surface layer is thicker than is typical for La Rose soils.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard if the soil is cropped intensively.

Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

La Rose silt loam, 4 to 7 percent slopes, eroded (60C2).—This soil is on somewhat rounded rises and the sides of ridges in the morainal parts of the county. It has the profile described as representative of the series. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas of Saybrook silt loam, 4 to 7 percent slopes, eroded. Also included are small severely eroded areas.

This soil is suited to the crops commonly grown in the county. Erosion is a severe hazard if the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

La Rose soils, 4 to 7 percent slopes, severely eroded (60C3).—These soils are on somewhat rounded rises and the sides of ridges in the morainal parts of the county. They have a profile similar to the one described as representative of the series, but the surface layer is mostly or entirely subsoil material.

Included with these soils in mapping are small areas of soils that are not severely eroded and areas where the surface layer and subsoil are thinner than is typical for La Rose soils.

These soils are suited to occasional cropping if erosion is adequately controlled. Controlling erosion is a necessary part of good management. Management group IIIe-1.

La Rose soils, 7 to 12 percent slopes, severely eroded (60D3).—These soils are on mounds and the sides of ridges in the morainal parts of the county. They have a profile similar to the one described as representative of the series, but the surface layer is mostly or entirely subsoil material.

Included with these soils in mapping are areas where the surface layer and subsoil are thinner than is typical for La Rose soils and small areas where slopes are less than 7 percent.

These soils are suited to hay or pasture but only occasional cropping. Erosion is a serious hazard. Suitable conservation practices reduce soil and water losses. Management group IVe-1.

Lena Series

The Lena series consists of nearly level to depressional, very poorly drained organic soils. These soils are in low-lying parts of the landscape in the Fox River Valley and in closed depressions of glacial outwash areas. They formed in fibrous plant remains in swampy areas that have a high concentration of snail shells. The native vegetation was reeds, sedges, and swamp grasses.

In a representative profile the thick black muck, which contains common snail shells, is about 68 inches thick. The next layer, about 14 inches thick, is black and dark-brown muck that has few snail shells and plant remains that are only partly decomposed. The next layer, about 22 inches thick, is black muck that contains common snail shells and is 8 to 10 percent mineral matter. The underlying material is dark-gray and very dark gray fine sandy loam.

Permeability is moderately rapid, and the available water capacity and organic-matter content are very high. If adequately drained and fertilized, Lena soils are suited to corn and soybeans. Areas too wet to cultivate are in pasture.

Representative profile of Lena muck, 210 feet south of road center and 27 feet east of center of sec. 4, T. 36 N., R. 6 E.

Oa1—0 to 10 inches, black (N 2/0) broken-faced and rubbed, sapric material; about 5 percent fiber, very little when rubbed; weak, medium, subangular blocky structure; common snail shells; strongly alkaline; clear, smooth boundary.

Oa2—10 to 24 inches, black (N 2/0) broken-faced and rubbed, sapric material; about 15 percent fiber, less than 5 percent rubbed; very weak, coarse, subangular blocky structure; common snail shells; strongly alkaline; diffuse, smooth boundary.

Oa3—24 to 68 inches, black (N 2/0) broken-faced and rubbed, sapric material; about 15 percent fiber in upper part and 20 percent in lower part; very weak, coarse, subangular blocky structure and massive; common snail shells; strongly alkaline; gradual, smooth boundary.

Oe1—68 to 82 inches, black (N 2/0) and dark-brown (7.5YR 3/2) broken-faced and black (N 2/0) rubbed, hemic material; about 50 percent fiber; massive; few snail shells; mildly alkaline; gradual, smooth boundary.

Oa4—82 to 104 inches, black (N 2/0, 5Y 2/1, and 5Y 2/2) broken faced and very dark gray (5Y 3/1) rubbed, sapric material; about 5 to 10 percent fiber; massive; common snail shells; strongly alkaline; abrupt, smooth boundary.

IIC—104 to 110 inches, dark-gray (5Y 4/1) and very dark gray (5Y 3/1) fine sandy loam; single grained; loose; moderately alkaline.

The sapric layers range from 51 to more than 100 inches in thickness, and the mineral content ranges from almost 0 to more than 60 percent where recent overwash has covered the surface. Hemic or undecomposed layers are variable in occurrence but are only a small part of any profile. Snail shells broken or whole are variable in all horizons. In most areas they are more numerous in the upper part of the profile.

Lena soils are similar to Houghton soils but are calcareous throughout.

Lena muck (0 to 2 percent slopes) **(210).**—This soil is on low-lying positions that were formerly swamps and a few seepy areas at the base of gravelly soil areas. It is almost entirely in the valleys of the Fox River and Blackberry Creek.

Included with this soil in mapping are small areas of recent overwash and small areas where the organic layer is less than 51 inches thick. Swampy areas are shown on the detailed soil map by the conventional symbol.

This soil has limited suitability for crops. The areas are difficult to drain, and the high level of carbonates results in less solubility of some phosphates. Management group IIIw-1.

Lisbon Series

The Lisbon series consists of nearly level, somewhat poorly drained soils. These soils are in areas between the low-lying Drummer soils and the somewhat higher Saybrook soils in the morainal areas of the county. Lisbon soils formed in thin deposits of silt loam material and in the underlying silt loam and loam glacial till. The native vegetation was prairie grasses.

In a representative profile the surface layer is black and very dark gray silt loam about 14 inches thick. The subsoil is silty clay loam and clay loam about 33 inches thick. In sequence from the top, it is dark grayish brown in the upper 6 inches, grayish brown in the next 8 inches, and mixed yellowish brown, grayish brown, and gray in the lower 19 inches. Yellowish-brown mottles are larger and brighter with increasing depth. The underlying material is mixed yellowish-brown and gray loam. It is moderately alkaline glacial till.

Permeability is moderate, and the available water capacity and organic-matter content are high. Most areas of Lisbon

soils are farmed intensively and used for corn and soybeans. They are also well suited to the other commonly grown crops. Some areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Lisbon silt loam, 102 feet south of road center and 202 feet west of blacktop center line, in the NE¼NE¼NE¼NE¼ sec. 19, T. 36 N., R. 8 E.

Ap—0 to 9 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A12—9 to 14 inches, very dark gray (10YR 3/1) heavy silt loam; moderate, fine and medium, granular structure; slightly acid; clear, smooth boundary.

B21t—14 to 20 inches, dark grayish-brown (10YR 4/2) silty clay loam; common, fine, faint, yellowish-brown (10YR 5/4) mottles; moderate, very fine, subangular blocky structure; coatings of very dark gray (10YR 3/1) on ped surfaces; firm; medium acid; clear, smooth boundary.

B22t—20 to 28 inches, grayish-brown (10YR 5/2) silty clay loam; many, medium, faint, yellowish-brown (10YR 5/4) mottles; moderate, fine, subangular blocky structure; thin coatings of very dark gray (10YR 3/1) on ped surfaces; firm; slightly acid; clear, smooth boundary.

B23t—28 to 36 inches, mixed grayish-brown (10YR 5/2) and yellowish-brown (10YR 5/6) silty clay loam; moderate, fine, prismatic structure parting to moderate, fine to medium, subangular blocky; patchy coatings of very dark gray (10YR 3/1) on vertical ped surfaces; firm; mildly alkaline; clear, smooth boundary.

IIIB3t—36 to 47 inches, gray (5Y 5/1) mixed with yellowish-brown (10YR 5/6) light clay loam; moderate, medium, prismatic structure and weak, coarse, subangular blocky; patchy coatings of very dark gray (10YR 3/1) on vertical ped surfaces; friable; mildly alkaline; gradual, wavy boundary.

IIC—47 to 58 inches, yellowish-brown (10YR 5/6) and gray (5Y 5/1) loam glacial till that contains many till pebbles; massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 17 inches in thickness. It is black to very dark gray silt loam to light silty clay loam. The B2 horizon is mainly silty clay loam but ranges to clay loam in the lower part. The B3 horizon ranges from silty clay loam to clay loam or heavy silt loam. In most places the solum ranges from 36 to 50 inches in thickness. The C horizon is silt loam or loam that contains varying amounts of glacial pebbles, stones, and boulders.

Lisbon soils are associated with Drummer and Saybrook soils. They are better drained than Drummer soils, but they are not so well drained as Saybrook soils. Lisbon soils contain less clay in the A horizon than Drummer soils.

Lisbon silt loam (0 to 2 percent slopes) (59).—This soil is in irregularly shaped areas that are at a somewhat higher elevation than the nearly level Drummer soils.

Included with this soil in mapping are small areas of Drummer silty clay loam and Saybrook silt loam, 0 to 2 percent slopes. Also included are small areas where the glacial till is deeper than the till in this soil.

This soil is very well suited to crops commonly grown in the county. A periodic high water table is the most serious limitation to the use of this soil. In many places drainage is required for good management if this soil is used for cultivated crops. Management group I-2.

Lorenzo Series

The Lorenzo series consists of moderately sloping to very steep, well-drained soils. These soils are on steep breaks and short slopes to drainageways along the Fox River and the large streams in the northwestern part of the county. They formed in glacial drift and outwash. The native vegetation was mixed trees, grasses, and shrubs.

In a representative profile the surface layer is very dark gray loam about 7 inches thick (fig. 7). The subsurface layer is very dark grayish-brown gravelly sandy loam 4 inches thick. The subsoil, about 8 inches thick, is dark yellowish-brown gravelly loam in the upper 5 inches and sandy loam to loamy gravel in the lower 3 inches. The underlying material is yellowish-brown, moderately alkaline loamy gravel.

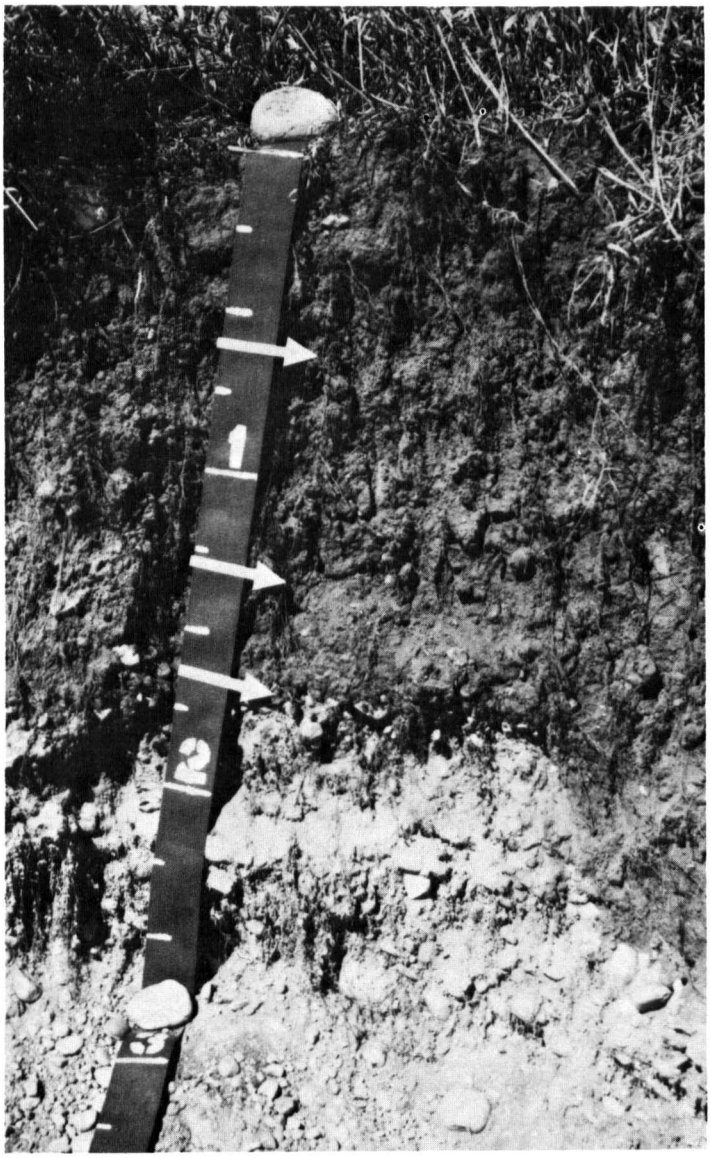

Figure 7.—**Profile of Lorenzo loam.**

Permeability is moderate in the surface layer and subsoil and rapid in the underlying material. The available water capacity is low, and the organic-matter content is moderate. Most areas of Lorenzo soils are in woodland or pasture. Only small areas are cropped, and these are marginal for the commonly grown crops. Erosion and low available water capacity are serious concerns of management.

Representative profile of Lorenzo loam, 18 to 40 percent slopes, 90 feet south of road center and 160 feet west of property line, in the NE¼NW¼NW¼ sec. 31, T. 37 N., R. 7 E.

A1—0 to 7 inches, very dark gray (10YR 3/1) loam; weak, fine, granular structure; friable; mildly alkaline; clear, smooth boundary.

AB—7 to 11 inches, very dark grayish-brown (10YR 3/2) gravelly sandy loam; weak, medium, subangular blocky structure; friable; neutral; clear, smooth boundary.

B2t—11 to 16 inches, dark yellowish-brown (10YR 4/4) gravelly loam; weak, medium and coarse, subangular blocky structure; friable; mildly alkaline; clear, smooth boundary.

B3—16 to 19 inches, dark yellowish-brown (10YR 4/4) sandy loam to loamy gravel; weak, medium and coarse, subangular blocky structure; friable; moderately alkaline; slight effervescence; clear, wavy boundary.

C—19 to 50 inches, yellowish-brown (10YR 5/4) loamy gravel; single grained; moderately alkaline; strong effervescence.

The A horizon ranges from 4 to 8 inches in thickness. It ranges from black to very dark grayish-brown loam to sandy loam. The B horizon ranges from dark grayish-brown to yellowish-brown sandy loam to light clay loam that contains variable amounts of gravel. The solum ranges from 12 to 24 inches in thickness. The C horizon is calcareous glacial drift. It is variable sandy loam, loamy gravel, and sand and gravel.

Lorenzo soils occur on the same landscape with Fox and Rush soils. They have a thinner solum than those soils.

Lorenzo loam, 4 to 7 percent slopes (318C).—This soil is on mounds and breaks to drainageways. It has a profile similar to the one described as representative of the series, but the profile contains more gravel.

Included with this soil in mapping are small areas where the combined surface layer and subsoil are thicker than is typical of Lorenzo soils. Small areas of severely eroded soils are indicated on the detailed soil map by the conventional symbol.

This soil is suited to small grains and occasional row crops. It is well suited to pasture and hay crops. Erosion control practices are needed where the soil is used for cultivated crops. Management group IIIs-1.

Lorenzo loam, 7 to 18 percent slopes, eroded (318D2).—This soil is on mounds and breaks to drainageways. It has a profile similar to the one described as representative of the series, but in cultivated areas the surface layer is thinner.

This soil is suited to permanent meadow, pasture, or woodland. Erosion is a serious concern of management for any use. Management group IVe-1.

Lorenzo loam, 18 to 40 percent slopes (318F).—This soil is on breaks that parallel the Fox River and the larger streams. It has the profile described as representative of the series.

Included with this soil in mapping are small areas where slopes are less than 18 percent. Also included are areas of soils that are more gravelly and have a thinner surface layer and subsoil than are typical of Lorenzo soils.

This soil is suited to woodland. Controlling erosion is a serious concern of management for any other use. Management group VII.

Martinton Series

The Martinton series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils are at a somewhat higher elevation in the level glacial lakebed areas in the southeastern part of the county. They formed in mainly silty clay loam lakebed sediments. The native vegetation was prairie grasses.

In a representative profile the surface layer is black heavy silt loam in the upper 8 inches and light silty clay loam in the lower 4 inches. The subsoil is about 30 inches thick. In sequence from the top, it is 6 inches of dark grayish-brown heavy silty clay loam, 9 inches of grayish-brown and brown silty clay, and 15 inches of mixed yellowish-brown and gray silty clay loam. Yellowish-brown mottles occur in the middle part of the subsoil. The underlying material has variable colors and is stratified sandy loam, silty clay, and some gravel.

Permeability is moderately slow, and the available water capacity and organic-matter content are high. Most areas of Martinton soils are farmed intensively and used for corn and soybeans. They are well suited to all the commonly grown crops. Some areas need additional drainage if they are to be cultivated early in spring.

Representative profile of Martinton silt loam, 0 to 2 percent slopes, 45 feet east of road center and 7 feet north of fence, in the SW¼SW¼SW¼SW¼ sec. 11, T. 35 N., R. 8 E.

Ap—0 to 8 inches, black (N 2/0) heavy silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A3—8 to 12 inches, black (N 2/0) light silty clay loam; moderate, fine to medium, granular structure; friable; neutral; clear, smooth boundary.

B21t—12 to 18 inches, dark grayish-brown (10YR 4/2) heavy silty clay loam; weak, fine, prismatic structure parting to moderate, very fine and fine, subangular blocky; continuous coatings of black (10YR 2/1) on peds; firm; slightly acid; clear, smooth boundary.

B22t—18 to 23 inches, brown (10YR 5/3) silty clay; many, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, very fine and fine, subangular blocky; continuous coatings of very dark gray (10YR 3/1) on peds; firm; neutral; clear, wavy boundary.

B23t—23 to 27 inches, grayish-brown (10YR 5/2) light silty clay; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine, subangular blocky; has coatings of dark grayish brown (10YR 4/2) on peds; firm; mildly alkaline; clear, smooth boundary.

B31—27 to 33 inches, mixed yellowish-brown (10YR 5/6) and gray (5Y 5/1) silty clay loam; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky; firm; moderately alkaline; slight effervescence; clear, smooth boundary.

B32—33 to 42 inches, mixed yellowish-brown (10YR 5/6) and gray (5Y 5/1) silty clay loam; moderate, medium, prismatic structure parting to moderate, fine to medium, subangular blocky; thin coatings of clay on vertical ped surfaces; firm; moderately alkaline; slight effervescence; abrupt, smooth boundary.

C1—42 to 50 inches, mixed yellowish-brown (10YR 5/6) and light-gray (10YR 7/2) sandy loam that has some gravel; dark organic stains in lower part; massive; very friable; moderately alkaline; strong effervescence; abrupt, smooth boundary.

C2—50 to 68 inches, dark grayish-brown (10YR 4/2) silty clay; massive; many, medium, distinct, greenish-gray (5GY 5/1) and yellowish-brown (10YR 5/6) mottles; firm; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 15 inches in thickness and from silt loam to silty clay loam. The B horizon is mainly silty clay loam but in places is silty clay. It ranges from brown to grayish brown and has variable amounts of yellowish-brown and grayish-brown mottles. In most places the solum ranges from 30 to 48 inches in thickness. The C horizon is mainly silty clay loam lakebed sediments, but in places it is stratified with silty clay, sandy loam, silt loam, and some gravelly sand. In many areas, strata of sand and gravel are 6 to 8 feet below the surface.

Martinton soils are associated with Del Rey and Milford soils. They are darker colored than Del Rey soils and better drained than Milford soils.

Martinton silt loam, 0 to 2 percent slopes (189A).—This soil is in broad, irregularly shaped areas. It occurs in the somewhat higher areas of the glacial lakebed landscape. The soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of

Milford silty clay loam. Also included are small areas of Mundelein silt loam and small areas of soils that have a brighter colored subsoil than is typical of Martinton soils.

A periodic high water table and moderately slow permeability are limitations to the use of this soil. In many places drainage is required for good management if this soil is used for crops. Management group IIw-4.

Martinton silt loam, 2 to 4 percent slopes (189B).—This soil is in irregularly shaped areas between areas of Martinton silt loam, 0 to 2 percent slopes, areas of poorly drained soils, and drainageways. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner.

Included with this soil in mapping are small eroded areas and areas of soils that have a brighter colored subsoil than is typical for Martinton soils.

Moderately slow permeability, wetness in spring, and a slight hazard of erosion are concerns of management. Control of erosion and drainage are generally needed if this soil is used for row crops. Management group IIe-2.

Milford Series

The Milford series consists of nearly level, poorly drained soils. These soils are in the glacial lakebed area in the southeastern part of the county. They formed in lakebed sediments that are mainly silty clay loam. The native vegetation was prairie grasses that were adapted to swampy areas.

In a representative profile the surface layer is black silty clay loam and light silty clay about 16 inches thick. The subsoil is grayish brown and is about 26 inches thick. In sequence from the top, it is 6 inches of silty clay, 10 inches of heavy silty clay loam, and 10 inches of silty clay loam and silt loam. Yellowish-brown mottles increase with increasing depth. The underlying material is yellowish-brown and gray stratified silt loam, loam, sandy loam, and silty clay. It is moderately alkaline glacial lakebed sediment.

Permeability is moderately slow, and the available water capacity and organic-matter content are high. Most Milford soils are farmed intensively and used for corn and soybeans. They are well suited to the other commonly grown crops. Many areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Milford silty clay loam, 98 feet south of highway center line and 75 feet east of lane center, in the NW¼NE¼NW¼SW¼ sec. 15, T. 35 N., R. 6 E.

A11—0 to 9 inches, black (N 2/0) silty clay loam; moderate, very fine and fine, granular structure; firm; mildly alkaline; clear, smooth boundary.

A12—9 to 16 inches, black (N 2/0) light silty clay; moderate, fine and medium, granular structure; firm; neutral; clear, smooth boundary.

B1g—16 to 22 inches, grayish-brown (2.5Y 5/2) silty clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, fine, prismatic structure parting to moderate, very fine, subangular blocky; continuous coatings of very dark gray (10YR 3/1) on peds; firm; neutral; clear, smooth boundary.

B2g—22 to 32 inches, grayish-brown (2.5Y 5/2) heavy silty clay loam; moderate, fine, prismatic structure parting to moderate, very fine, subangular blocky; continuous coatings of very dark gray (10YR 3/1) on peds; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; firm; neutral; clear, smooth boundary.

B3g—32 to 42 inches, grayish-brown (2.5Y 5/2) mixed with yellowish-brown (10YR 5/6) silty clay loam and silt loam that has a noticeable content of sand; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of dark gray (10YR 4/1) on vertical ped surfaces; firm; mildly alkaline; abrupt, wavy boundary.

C—42 to 64 inches, yellowish-brown (10YR 5/6) mixed with gray (5Y 5/1) stratified silt loam, loam, sandy loam, and silty clay; massive; very dark gray (10YR 3/1) krotovinas to a depth of 58 inches; moderately alkaline; strong effervescence.

The A horizon ranges from 12 to 18 inches in thickness. The B2 horizon ranges from dark grayish-brown to gray silty clay loam to silty clay, and the finer textures are in the upper part. The B3 horizon ranges from clay loam to heavy silty clay loam and in many places is stratified. In most places the solum ranges from 40 to 55 inches in thickness. The underlying material in many places has variable textures that range from sandy loam to silty clay.

Milford soils are associated with Martinton and Del Rey soils. They are more poorly drained and have more clay in the A horizon than those soils. Milford soils occur in positions similar to those in which Drummer and Bryce soils occur. They contain more clay throughout the solum than Drummer soils and less clay throughout the solum than Bryce soils.

Milford silty clay loam (0 to 2 percent slopes) **(69).**—This soil is in broad, irregularly shaped areas and, to a lesser extent, in long natural drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are areas where the surface layer is thicker than is typical for Milford soils. Also included are small areas of Martinton silt loam, 0 to 2 percent slopes, and small areas of Bryce silty clay. Wet areas that are less than 2 acres in size are shown on the detailed soil map by the conventional symbol.

This Milford soil is well suited to the crops commonly grown in the county. The seasonal high water table is a serious limitation to the use of this soil. Artificial drainage is required for good management. Management group IIw-1.

Milford silty clay loam, bedrock substratum (0 to 2 percent slopes) **(R69).**—This soil is in glacial lakebed areas adjacent to soils that are shallow to limestone bedrock. It has a profile similar to the one described as representative of the series, but limestone bedrock is at a depth of 46 to 55 inches.

Included with this soil in mapping are areas where the surface layer is thicker than is typical for Milford soils. Also included are small areas of Martinton silt loam, 0 to 2 percent slopes, and small areas of Bryce silty clay.

This Milford soil is well suited to crops commonly grown in the county. The seasonal high water table is a serious limitation to the use of this soil. In many places artificial drainage is required for many of the common and adapted crops. Management group IIw-1.

Millbrook Series

The Millbrook series consists of nearly level, somewhat poorly drained soils. These soils are in the glacial outwash areas in the northern and western parts of the county. They formed in thin deposits of silt loam material and in the underlying stratified sandy loam, silt loam, and sand glacial outwash. The native vegetation was mixed prairie grasses and hardwood trees.

In a representative profile the surface layer is very dark gray silt loam 9 inches thick. The subsurface layer, about 4 inches thick, is grayish-brown silt loam. The subsoil is about 39 inches thick. In sequence from the top, it is 30 inches of brown and grayish-brown silty clay loam and clay loam that has yellowish-brown mottles and 9 inches of mixed gray and yellowish-brown clay loam. The underlying material is mixed light brownish-gray and gray stratified

sandy loam, sand, and loamy gravel. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Most areas of Millbrook soils are farmed intensively to corn and soybeans. The soils are well suited to the other commonly grown crops. Some areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Millbrook silt loam, 112 feet east and 1,560 feet north of the southwest corner of the NW¼ sec. 16, T. 37 N., R. 7 E.

Ap—0 to 9 inches, very dark gray (10YR 3/1) silt loam; weak, very fine, granular structure; friable; neutral; abrupt, smooth boundary.

A2—9 to 13 inches, grayish-brown (10YR 5/2) silt loam that has very dark gray (10YR 3/1) stains; weak, medium, platy structure parting to moderate, fine, granular; friable; medium acid; clear, smooth boundary.

B21t—13 to 19 inches, grayish-brown (10YR 5/2) silty clay loam; few, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, very fine, subangular blocky structure; continuous coatings of very dark gray (10YR 3/1) on peds; firm; medium acid; clear, smooth boundary.

B22t—19 to 29 inches, brown (10YR 5/3) silty clay loam; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings of very dark gray (10YR 3/1) on peds; firm; slightly acid; clear, smooth boundary.

IIB23t—29 to 43 inches, grayish-brown (10YR 5/2) clay loam that has a high content of silt; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of dark grayish brown (10YR 4/2) on vertical ped faces; firm; neutral; clear, smooth boundary.

IIB3—43 to 52 inches, gray (5Y 5/1) and yellowish-brown (10YR 5/6) clay loam; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; firm; mildly alkaline; gradual, smooth boundary.

IIC—52 to 61 inches, light brownish-gray (10YR 6/2) and gray (5Y 5/1) stratified sandy loam, sand, and loamy gravel; single grained; loose; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 17 inches in thickness. The A1 horizon is black to very dark grayish brown. The A2 horizon is grayish brown to dark grayish brown. The B2 horizon is mainly silty clay loam, but the lower part ranges to clay loam. The B3 horizon ranges from silty clay loam that has a gritty feel and clay loam to loam. In most places the solum ranges from 40 to 55 inches in thickness. The C horizon has variable thicknesses of sandy loam, silt loam, sand, and in some places gravel.

Millbrook soils are associated with Drummer, Brenton, and Camden soils. They are better drained than Drummer soils and more poorly drained than Camden soils. They contain less clay in the A horizon than Drummer soils and have a thicker, darker A1 horizon than Camden soils. Millbrook soils have an A horizon similar to that of Thorp soils in color and texture. They are better drained than Thorp soils, and they have an A2 horizon, which Brenton soils do not have.

Millbrook silt loam (0 to 2 percent slopes) (219).—This soil is in irregularly shaped areas that are slightly elevated and near more poorly drained soils or in nearly level areas near more sloping soils.

Included with this soil in mapping are areas of soils that have finer textured material in the lower part of the subsoil and in the underlying material. Also included are a few areas where the upper part of the subsoil is finer textured than is typical of Millbrook soils.

This soil is well suited to crops commonly grown in the county. A periodic high water table is the most serious limitation to the use of this soil. In places artificial drainage is needed to lower the temporary water table and to remove surface water. Management group I-2.

Millington Series

The Millington series consists of nearly level, poorly drained soils on bottom lands along the Fox River. These soils formed in water-laid silt loam to loam sediments.

In a representative profile the surface layer is black, calcareous silt loam about 12 inches thick. The upper part of the subsoil, about 14 inches thick, is very dark gray, calcareous silt loam. The lower part, about 25 inches thick, is grayish-brown, calcareous heavy silt loam. The underlying material is mixed light-gray and greenish-gray marly silt loam.

Permeability is moderate, and the available water capacity and organic-matter content are high. Where Millington soils are practical to cultivate, they are suited to corn and soybeans. Because of frequent flooding, many areas are in pasture or woodland. The hazard of overflow and a seasonal high water table are the major concerns of management.

Representative profile of Millington silt loam, 600 feet north and 580 feet west of the southeast corner of sec. 34, T. 37 N., R. 6 E.

A1—0 to 12 inches, black (10YR 2/1) silt loam; moderate, medium, granular structure; friable; moderately alkaline; strong effervescence; broken snail shells; gradual, smooth boundary.

B—12 to 26 inches, very dark gray (10YR 3/1) silt loam that has a moderate content of sand; moderate, very fine to fine, subangular blocky structure; continuous coatings of black (10YR 2/1) on peds; friable; moderately alkaline; strong effervescence; broken snail shells; clear, smooth boundary.

Bg—26 to 51 inches, grayish-brown (2.5Y 5/2) heavy silt loam that has a moderate content of sand; weak, coarse, prismatic structure parting to moderate, fine to medium, subangular blocky; coatings of very dark gray (10YR 3/1) on vertical ped surfaces, dark gray (10YR 4/1) in lower half; friable; moderately alkaline; strong effervescence; gradual, wavy boundary.

Cg—51 to 66 inches, mixed light-gray (5Y 7/1) and greenish-gray (5GY 6/1) marly silt loam; massive; friable; strongly alkaline; violent effervescence.

The dark-colored A horizon and the B horizon range from 24 to 52 inches in thickness and from silt loam to loam in texture. The entire profile contains variable amounts of snail shells, and every horizon is calcareous. The lower part of the B horizon ranges from gray to grayish-brown silt loam to loam or sandy loam. The C horizon has variable textures of sand, marl, and in some places gravel.

Millington soils are associated with DuPage soils along the Fox River. They are more poorly drained than DuPage soils.

Millington silt loam (0 to 2 percent slopes) (82).—This soil is on bottom lands where the areas are long strips on both sides of the river bank and also occur on islands in the river. Because of limited size, most areas are used for woodland or pasture.

Included with this soil in mapping are small areas of DuPage silt loam and small areas of soils that have a thinner surface layer and subsoil than is typical of Millington soils. Very wet areas are indicated on the detailed soil map by the conventional symbol. Management group IIw-2.

Mundelein Series

The Mundelein series consists of nearly level, somewhat poorly drained soils. These soils are in the glacial outwash areas in the eastern part of the county. They formed in thin deposits of silt loam material and in the underlying stratified loamy glacial outwash. The native vegetation was prairie grasses.

In a representative profile the surface layer is black silt loam about 11 inches thick. The subsoil is about 30 inches thick. In sequence from the top, the upper 5 inches is very dark grayish-brown silty clay loam, the next 9 inches is dark grayish-brown silty clay loam, the next 9 inches is grayish-brown silty clay loam, and the lower 7 inches is mixed grayish-brown silt loam and sandy loam. The underlying material is stratified clay loam and silt loam that contains thin strata of sand. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity and organic-matter content are high. Most areas of Mundelein soils are farmed intensively and used for corn and soybeans. They are well suited to the other commonly grown crops. Some areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Mundelein silt loam, 75 feet south of road center and 240 feet west of the northeast corner of the NW¼NW¼ sec. 34, T. 36 N., R. 7 E.

Ap—0 to 7 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A12—7 to 11 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; neutral; clear, smooth boundary.

B1t—11 to 16 inches, very dark grayish-brown (10YR 3/2) silty clay loam; moderate, fine, subangular blocky structure; coatings of black (10YR 2/1) on peds; firm; slightly acid; clear, smooth boundary.

B21t—16 to 25 inches, dark grayish-brown (10YR 4/2) silty clay loam; few, fine, distinct, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/4) mottles; moderate, fine, prismatic structure parting to moderate, fine and medium, subangular blocky; coatings of very dark gray (10YR 3/1) on peds; firm; slightly acid; clear, smooth boundary.

IIB22t—25 to 34 inches, grayish-brown (10YR 5/2) silty clay loam that has a high content of sand; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; thin coatings of dark gray (10YR 4/1) on peds; firm; mildly alkaline; clear, smooth boundary.

IIB3—34 to 41 inches, grayish-brown (10YR 5/2) silt loam and two thin strata of sandy loam; many, medium, distinct, yellowish-brown (10YR 5/6 and 5/8) mottles; weak, medium, prismatic structure parting to weak, medium and coarse, subangular blocky; friable; moderately alkaline; slight effervescence; abrupt, smooth boundary.

IIC—41 to 55 inches, light brownish-gray (10YR 6/2) and yellowish-brown (10YR 5/6 and 5/8) stratified clay loam and silt loam separated by thin sand lenses; massive and single grained; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 16 inches in thickness. The B1 horizon is not always discernible. The B2 horizon ranges from silty clay loam to clay loam in the lower part, which is mildly alkaline to moderately alkaline. The B3 horizon ranges from clay loam to sandy loam. In most places the solum ranges from 36 to 50 inches in thickness. The C horizon contains strata of variable thickness. These strata consist of sandy loam, clay loam, silt loam, loam, sand, and gravel.

Mundelein soils are associated with Drummer and Barrington soils. They are better drained and have less clay in the A horizon than Drummer soils. They are more poorly drained than Barrington soils.

Mundelein silt loam (0 to 2 percent slopes) (442).—This soil is in irregularly shaped areas that are at a somewhat higher elevation than the level surrounding areas.

Included with this soil in mapping are small areas of Drummer silty clay loam and Barrington silt loam, 0 to 2 percent slopes. Also included are small areas where calcareous glacial till is at a depth of 40 to 60 inches.

This Mundelein soil is well suited to the crops commonly grown in the county. A periodic high water table is the most serious limitation to the use of this soil. In many places artificial drainage is needed for good results. Management group I-2.

Nappanee Series

The Nappanee series consists of nearly level to gently sloping, somewhat poorly drained soils. These soils are mainly along Aux Sable Creek and in a small area east of Yorkville. They formed in silty clay to clay glacial lakebed sediments. The native vegetation was hardwood trees.

In a representative profile the surface layer is dark grayish-brown silt loam about 9 inches thick. The subsurface layer is grayish-brown silt loam about 4 inches thick. The subsoil is about 39 inches thick. The upper 5 inches is dark-gray clay, the middle 14 inches is grayish-brown to greenish-gray silty clay that has yellowish-brown mottles, and the lower 20 inches is mixed greenish-gray and yellowish-brown silty clay. The underlying material is light olive-brown silty clay that has gray mottles. It is moderately alkaline lakebed sediment.

Permeability is very slow, and the available water capacity is moderate. The organic-matter content is low. Many areas of Nappanee soils are cropped along with the surrounding Swygert and Bryce soils. Other areas are in woodland and pasture. Providing drainage, maintaining good tilth, and increasing the organic-matter content are the major concerns of management. Erosion is a concern in small areas of gently sloping soils.

Representative profile of Nappanee silt loam, 0 to 2 percent slopes, 1,090 feet south and 38 feet east of the northwest corner of sec. 22, T. 35 N., R. 8 E.

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) silt loam; weak, very fine, granular structure; friable; mildly alkaline; abrupt, smooth boundary.

A2—9 to 13 inches, grayish-brown (10YR 5/2) silt loam; weak, medium, platy structure parting to weak, fine, granular; friable; neutral; abrupt, smooth boundary.

B21t—13 to 18 inches, dark-gray (5Y 4/1) clay; many, medium, faint, yellowish-brown (10YR 5/4) mottles; moderate, fine, prismatic structure parting to strong, fine, subangular blocky; coatings of very dark gray (10YR 3/1) on peds; very firm; slightly acid; clear, smooth boundary.

B22t—18 to 26 inches, grayish-brown (2.5Y 5/2) heavy silty clay; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to strong, very fine, subangular blocky; coatings of very dark gray (5Y 3/1) on peds; very firm; medium acid; clear, smooth boundary.

B23—26 to 32 inches, mixed greenish-gray (5GY 6/1) and yellowish-brown (10YR 5/6) silty clay; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of dark gray (5Y 4/1) on vertical surfaces of peds; very firm; mildly alkaline; gradual, smooth boundary.

B3—32 to 52 inches, mixed greenish-gray (5GY 6/1) and yellowish-brown (10YR 5/6) silty clay; strong, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of gray (5Y 5/1) on vertical surfaces of peds; very firm; moderately alkaline; strong effervescence; gradual, smooth boundary.

C—52 to 75 inches, light olive-brown (2.5Y 5/4) silty clay; gray (5Y 5/1) mottles; medium and coarse prismatic structure and massive; very firm; moderately alkaline; strong effervescence.

The A horizon ranges from 6 to 13 inches in thickness. It ranges from dark grayish brown to grayish brown. In many areas disturbed by plowing the A2 horizon does not occur. The B and C horizons are mainly shades of gray, grayish brown, and greenish gray and are mottled with yellowish brown. These horizons range from silty clay to clay. Stratification is evident in the lower part of the B horizon and in the C horizon.

In Kendall County the solum of the Nappanee soils is thicker than is within the defined range for the series. This difference does not alter the usefulness and behavior of these soils.

Nappanee soils are associated with Swygert, Bryce, and Del Rey soils. They are lighter colored than Swygert and Bryce soils and better drained than Bryce soils. They contain more clay in the B and C horizons than Del Rey soils.

Nappanee silt loam, 0 to 2 percent slopes (228A).—This soil is generally in a narrow band adjacent to Aux Sable Creek in Seward Township. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of soils that have a darker colored surface layer and small areas of Bryce silty clay.

The most serious limitations to the use of this soil are the slow movement of water through it, a seasonal high water table, and low organic-matter content.

If adequately drained and well managed, this soil is suited to most crops. It occurs with larger areas of Swygert and Bryce soils, and if cropped, it is generally farmed in the same way as those soils. Management group IIw-4.

Nappanee silt loam, 2 to 4 percent slopes (228B).—This soil is on small rises surrounded by level soils or is on short breaks into bottom lands and areas of Bryce soils.

Included with this soil in mapping are areas of soils that have a darker colored surface layer and small areas of Bryce silty clay. Also included are small areas where the subsoil has been mixed with the surface layer.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard in cropped areas. Management group IIIe-2.

Peotone Series

The Peotone series consists of nearly level, very poorly drained soils. These soils are in depressions in all parts of the county, except the southeastern part. They formed in silty and clayey water-deposited materials. The native vegetation was swamp grasses.

In a representative profile the surface layer is black silty clay loam about 18 inches thick. The subsoil, about 39 inches thick, is very dark gray silty clay in the upper part, dark-gray silty clay loam in the middle, and gray and yellowish-brown heavy silt loam in the lower part. The underlying material is gray and yellowish-brown heavy silt loam. It is strongly alkaline glacial drift.

Permeability is moderate to a depth of about 18 inches and moderately slow below that depth. The available water capacity is very high, and the organic-matter content is high. Most areas of Peotone soils have been cultivated and are planted to corn or soybeans. Undrained areas are idle or pastured. Adequate drainage is a severe concern of management because in many places outlets are inadequate and the areas receive runoff from surrounding higher areas.

Representative profile of Peotone silty clay loam, 160 feet west of highway center and 75 feet south of road center, in the NE¼NE¼NE¼ sec. 13, T. 37 N., R. 8 E.

Ap—0 to 10 inches, black (N 2/0) silty clay loam; moderate, fine, granular structure; firm; mildly alkaline; abrupt, smooth boundary.

A12—10 to 18 inches, black (N 2/0) heavy silty clay loam; moderate, medium, granular structure; firm; mildly alkaline; clear, smooth boundary.

B1g—18 to 26 inches, very dark gray (2.5Y 3/0) silty clay; few, fine, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, prismatic structure parting to strong, fine, subangular blocky; coatings of black (N 2/0) on peds; very firm; mildly alkaline; clear, smooth boundary.

B21g—26 to 34 inches, dark-gray (5Y 4/1) and yellowish-brown (10YR 5/6) heavy silty clay loam; moderate, medium, prismatic structure parting to strong, fine and medium, subangular blocky; coatings of very dark gray (2.5Y 3/1) on vertical ped surfaces; firm; neutral; clear, smooth boundary.

B22g—34 to 39 inches, gray (5Y 5/1) and yellowish-brown (10YR 5/6) silty clay loam; moderate, coarse, prismatic structure parting to strong, fine and medium, subangular blocky; firm; mildly alkaline; clear, wavy boundary.

B3g—39 to 57 inches, gray (5Y 5/1) and yellowish-brown (10YR 5/6) heavy silt loam; moderate, coarse, prismatic structure parting to weak, medium and coarse, subangular blocky; firm; mildly alkaline; gradual, wavy boundary.

C—57 to 68 inches, gray (N 5/0) and yellowish-brown (10YR 5/6) heavy silt loam; massive; strongly alkaline; strong effervescence.

The A horizon ranges from 16 to 28 inches in thickness and is variable because of recent deposits from surrounding soils. This horizon ranges from silt loam to heavy silty clay loam. The B1 horizon is black to very dark gray. The B2 horizon is dark gray to gray mixed with yellowish brown. The B horizon ranges from silty clay in the upper part to heavy silt loam or loam in the lower part. The solum ranges from 48 to 60 inches in thickness. The C horizon is mixed yellowish-brown and gray sandy loam, gravelly loam, loam, or silt loam glacial drift.

Peotone soils formed in material similar to that in which Drummer, Milford, and Sawmill soils formed. They have a thicker A horizon and are more poorly drained than Drummer and Milford soils. They have a thinner A horizon and contain more clay in the B horizon than Sawmill soils.

Peotone silty clay loam (0 to 2 percent slopes) (330).—This soil is in depressions and is subject to ponding.

Included with this soil in mapping are small areas of Drummer, Milford, or Harpster soils, which are on the slightly higher parts of the landscape. Also included are small areas of soils that are too wet for cultivation and a few areas where there is more than 10 inches of recent deposition. Wet areas that are less than 2 acres in size and swampy areas are shown on the detailed soil map by the conventional symbols.

Use of this soil is dependent on adequate drainage. If the drainage system ceases to function, the soil area can revert to a marsh. Most areas are used for crops. Excess water in spring and early in summer often causes crop damage. Providing adequate drainage and maintaining good tilth are necessary for good management. Management group IIw-3.

Plano Series

The Plano series consists of nearly level to moderately sloping, well drained and moderately well drained soils. These soils are in large, broad areas in the northwestern part of the county. They formed in moderately thick deposits of silt loam material and in the underlying sandy loam till or stratified loamy glacial outwash. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark brown silt loam about 14 inches thick. The subsoil is about 52 inches thick. In sequence from the top, it is 5 inches of very dark grayish-brown heavy silt loam; 33 inches of brown, dark yellowish-brown, and yellowish-brown silty clay loam and heavy silt loam; and 14 inches of brown to dark-brown loam and gravelly sandy loam. The underlying material is brown sandy loam. It is moderately alkaline glacial drift.

Permeability is moderate, and the available water capacity and organic-matter content are high. Plano soils are well suited to all the commonly grown crops. Most areas are farmed intensively and used for corn and soybeans. Increasing the organic-matter content and protecting the gently sloping

and moderately sloping soils from erosion are the major concerns of management.

Representative profile of Plano silt loam, 0 to 2 percent slopes, 50 feet north of road center and 20 feet east of fence, in the SW¼SE¼SW¼SE¼ sec. 2, T. 37 N., R. 6 E.

Ap—0 to 7 inches, very dark brown (10YR 2/2) silt loam; moderate, fine and medium, granular structure; friable; slightly acid; abrupt, smooth boundary.

A12—7 to 14 inches, very dark brown (10YR 2/2) silt loam; weak, fine, granular structure; friable; medium acid; clear, smooth boundary.

B1—14 to 19 inches, very dark grayish-brown (10YR 3/2) heavy silt loam; moderate, fine, subangular blocky structure; medium acid; clear, smooth boundary.

B21t—19 to 29 inches, brown (10YR 4/3) silty clay loam; moderate, medium, subangular blocky structure; coatings of dark brown (7.5YR 4/4) on peds; firm; medium acid; clear, wavy boundary.

B22t—29 to 39 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, medium and coarse, subangular blocky structure; coatings of dark brown (7.5YR 4/4) on peds; firm; medium acid; abrupt, wavy boundary.

B31—39 to 52 inches, yellowish-brown (10YR 5/4) heavy silt loam; weak, coarse, subangular blocky structure; few discontinuous coatings of dark brown (7.5YR 4/4) on peds; friable; medium acid; clear, smooth boundary.

IIB32—52 to 62 inches, brown (10YR 5/3) loam; weak, coarse, subangular blocky structure; coatings of dark yellowish brown (10YR 4/4) on vertical ped surfaces and in root channels; friable; slightly acid; abrupt, smooth boundary.

IIB33—62 to 66 inches, dark-brown to brown (7.5YR 4/4) gravelly sandy loam; weak, coarse, subangular blocky structure; friable; mildly alkaline; abrupt, smooth boundary.

IIC—66 to 80 inches, brown (10YR 5/3) sandy loam; massive; many small stones or fine pebbles; moderately alkaline; strong effervescence.

The A horizon ranges from black to very dark grayish brown in color and from 10 to 16 inches in thickness. The upper part of the B horizon ranges from very dark grayish brown to yellowish brown. The lower part ranges from brown to reddish-brown clay loam to sandy loam that in some places is mottled. The solum ranges from 45 inches to more than 60 inches in thickness. The underlying material has variable textures of sandy loam, silt loam, loam, sand, and in some places gravel.

Plano soils are associated with Drummer and Elburn soils and are similar to Proctor soils. They are better drained than Drummer and Elburn soils. They contain less sand above a depth of 40 inches than Proctor soils.

Plano silt loam, 0 to 2 percent slopes (199A).—This soil is in large upland areas that have indistinct drainage patterns. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Elburn silt loam and Batavia silt loam, 0 to 2 percent slopes, where this Plano soil is adjacent to areas of St. Charles soils. Also included are small areas where the lower part of the subsoil is mottled.

This soil is well suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Plano silt loam, 2 to 4 percent slopes (199B).—This soil is in broad upland areas that have indistinct drainage patterns.

Included with this soil in mapping are small areas of Elburn silt loam and Batavia silt loam, 0 to 2 percent slopes, this Plano soil is adjacent to areas of St. Charles soils. Also included are small areas where the lower part of the subsoil is mottled and areas of soils that have a thinner surface layer and subsoil than is typical for Plano soils.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard, but the irregular topography limits the use of erosion control practices. Management group IIe-1.

Plano silt loam, 4 to 7 percent slopes, eroded (199C2).—This soil has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface.

Included with this soil in mapping are small areas where the underlying calcareous sandy loam drift is at a depth of less than 45 inches.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard where the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Plattville Series

The Plattville series consists of nearly level to gently sloping, moderately well drained to well drained soils. These soils are in a somewhat elevated area in the south-central part of the county. They formed in moderately thick deposits of silt loam and loamy material that is underlain by limestone bedrock at a depth of 40 to 55 inches. The native vegetation was prairie grasses.

In a representative profile the surface layer is black and very dark brown silt loam about 12 inches thick. The subsoil, about 32 inches thick, is brown and dark-brown silty clay loam in the upper 9 inches, dark yellowish-brown silty clay loam and clay loam in the middle, and brown sandy clay loam in the lower 5 inches. The underlying material is unweathered limestone bedrock.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Plattville soils are well suited to all the commonly grown crops. Increasing the organic-matter content and protecting the gently sloping soils from erosion are the major concerns of management.

Representative profile of Plattville silt loam, 0 to 2 percent slopes, 621 feet south of road center and 285 feet east of lane, in the SW¼NE¼SW¼ sec. 28, T. 37 N., R. 7 E.

Ap—0 to 8 inches, black (10YR 2/1) silt loam; moderate, medium, granular structure; friable; slightly acid; abrupt, smooth boundary.

A12—8 to 12 inches, very dark brown (10YR 2/2) and very dark grayish-brown (10YR 3/2) silt loam; moderate, medium, granular structure; friable; medium acid; clear, smooth boundary.

B1—12 to 17 inches, dark-brown (10YR 3/3) light silty clay loam; weak, medium, subangular blocky structure; coatings of very dark brown (10YR 2/2) on peds; friable; medium acid; clear, smooth boundary.

B21t—17 to 21 inches, brown (10YR 4/3) silty clay loam; moderate, fine, subangular blocky structure; discontinuous coatings of dark brown (10YR 3/3) on peds; firm; medium acid; gradual, smooth boundary.

B22t—21 to 27 inches, dark yellowish-brown (10YR 4/4) silty clay loam; few, fine, distinct, strong-brown (7.5YR 5/6) mottles and few, fine, faint, pale-brown (10YR 5/3) mottles; moderate, fine and medium, subangular blocky structure; thin discontinuous coatings of brown (10YR 4/3) on peds; medium acid; clear, smooth boundary.

B23t—27 to 39 inches, dark yellowish-brown (10YR 4/4) clay loam; few, fine, distinct, strong-brown (7.5YR 5/6) mottles and few, fine, pale-brown (10YR 5/3) mottles; moderate, medium, subangular blocky structure; thin coatings of brown (10YR 4/3) on peds; medium acid to slightly acid; clear, smooth boundary.

B3—39 to 44 inches, brown (7.5YR 4/4) sandy clay loam; weak, coarse, subangular blocky structure that has coatings of dark brown (10YR 3/3); mildly alkaline; abrupt, smooth boundary.

IIR—44 inches, limestone bedrock, flat bedded.

The A horizon ranges from 10 to 16 inches in thickness and from black to very dark grayish brown in color. The B horizon ranges from 20 to 42 inches in thickness. In most places the B horizon is silty clay loam in the upper part and ranges to clay loam, sandy clay loam, or loam in the lower part. The solum ranges from 40 to 55 inches in thickness. The underlying limestone bedrock in most areas is flat bedded and unweathered and has only a few fractures.

Plattville soils are near Ripon soils. They are deeper over limestone bedrock than Ripon soils.

Plattville silt loam, 0 to 2 percent slopes (240A).—This soil is in irregularly shaped areas that are at a higher elevation than the surrounding soils. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Ripon silt loam, 1 to 4 percent slopes, and Brenton silt loam, bedrock substratum. Also included are small areas of soils that have a finer textured subsoil than is typical of Plattville soils.

This soil is suited to the crops commonly grown in the county. If well managed, this soil can be cropped intensively. Management group I-1.

Plattville silt loam, 2 to 4 percent slopes (240B).—This soil is associated with Plattville silt loam, 0 to 2 percent slopes. It has a profile similar to the one described as representative of the series, but it tends have a thinner surface layer and subsoil.

Included with this soil in mapping are small areas of the nearly level Plattville soil and Ripon silt loam, 1 to 4 percent slopes. Also included are small areas where the subsoil is finer textured.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard. Adapted erosion control practices should be used to control soil losses. Management group IIe-1.

Proctor Series

The Proctor series consists of nearly level to moderately sloping, moderately well drained and well drained soils. These soils are on the higher parts of the glacial outwash areas of the county. They formed in thin deposits of silt loam material and in the underlying stratified loam, silt loam, sandy loam, and sand glacial outwash. The native vegetation was prairie grasses.

In a representative profile the surface layer is black to very dark grayish-brown silt loam about 14 inches thick. The subsoil is dark-brown to dark yellowish-brown silty clay loam and clay loam about 39 inches thick. The underlying material is yellowish-brown sandy loam. It is moderately alkaline glacial outwash.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Proctor soils are well suited to all the commonly grown crops. Most areas are farmed intensively and used for corn and soybeans. Increasing the organic-matter content and protecting the gently sloping and moderately sloping soils from erosion are the major concerns of management.

Representative profile of Proctor silt loam, 0 to 2 percent slopes, 1,590 feet east and 28 feet south of center of sec. 7, T. 37 N., R. 7 E.

Ap—0 to 10 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; slightly acid; abrupt, smooth boundary.

A3—10 to 14 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; medium acid; clear, smooth boundary.

B21t—14 to 21 inches, dark-brown (10YR 3/3) light silty clay loam; moderate, very fine, subangular blocky structure; continuous stains of very dark grayish brown (10YR 3/2) on peds; firm; medium acid; clear, smooth boundary.

B22t—21 to 31 inches, dark-brown (10YR 4/3) silty clay loam; weak, medium, prismatic structure parting to moderate, very fine and fine, subangular blocky; firm; medium acid; abrupt, smooth boundary.

IIB23t—31 to 37 inches, dark-brown (10YR 4/3) silty clay loam that has a noticeable content of sand and many small pebbles; few, fine, faint, yellowish-brown (10YR 5/6) mottles and few, fine, faint, dark grayish-brown (10YR 4/2) mottles; weak, medium, prismatic structure parting to moderate, medium, subangular blocky; coatings of very dark grayish brown (10YR 3/2) on peds; firm; medium acid; gradual, smooth boundary.

IIB3t—37 to 53 inches, dark yellowish-brown (10YR 4/4) clay loam; common, fine, faint, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky; thin coatings of very dark grayish brown (10YR 3/2) on peds; firm; slightly acid; gradual, wavy boundary.

IIC—53 to 60 inches, yellowish-brown (10YR 5/4) sandy loam; structureless; single grained; loose; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 15 inches in thickness and from black to dark brown in color. The B2 horizon ranges from silty clay loam to clay loam, and the B3 horizon ranges from silty clay loam that has a gritty feel and clay loam to loam. The solum ranges from 38 to 55 inches in thickness. The C horizon is stratified silt loam, sandy loam, sand, and in some places gravel.

Proctor soils are associated with Brenton and Drummer soils and are similar to Barrington soils. They are better drained than Brenton and Drummer soils and contain less clay in the A horizon than Drummer soils. Proctor soils have carbonates at a greater depth than Barrington soils.

Proctor silt loam, 0 to 2 percent slopes (148A).—This soil is in the highest areas, generally in level outwash areas. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Brenton silt loam and areas where the subsoil is finer textured than is typical for Proctor soils. Also included are small areas where calcareous glacial till is at a depth of 40 to 60 inches.

This soil is suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Proctor silt loam, 2 to 4 percent slopes (148B).—This soil commonly is on small rises that are surrounded by other nearly level soils. It has a profile similar to the one described as representative of the series, but the surface layer is thinner.

Included with this soil in mapping are small areas of Brenton silt loam and areas where the subsoil is finer textured than is typical for Proctor soils. Also included are small areas where calcareous glacial till is at a depth of 40 to 60 inches and areas where part of the subsoil has been mixed with the surface layer.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard, but the size of the areas and the irregular topography limit the use of some erosion control practices. Where they are practical to install, these practices reduce soil losses. Management group IIe-1.

Proctor silt loam, 4 to 7 percent slopes, eroded (148C2).—This soil is on the more sloping parts of the outwash areas of Kendall County. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas where calcareous glacial till is at a depth of 40 to 60 inches. Also included are small areas where slopes are less than 4 percent. Places where the subsoil is not mottled are included.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard where the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Ripon Series

The Ripon series consists of nearly level to moderately sloping, well-drained soils. These soils are mainly in the south-central part of the county but to a lesser extent they are around Oswego and in the Fox River Valley. They formed in thin deposits of silt loam and loamy material. Bedrock is at a depth of 20 to 40 inches. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark gray and very dark grayish-brown silt loam about 11 inches thick. The subsoil is about 18 inches thick. It is dark-brown and dark yellowish-brown silty clay loam in the upper 14 inches and dark-brown clay loam in the lower 4 inches. The underlying material is unweathered limestone bedrock.

Permeability is moderate, and the available water capacity is low. The organic-matter content is moderate. Ripon soils have only limited suitability for corn and soybeans because of the limited root zone. Controlling erosion and maintaining the organic-matter content are the major concerns of management.

Representative profile of Ripon silt loam, 1 to 4 percent slopes, 70 feet southwest of road center and 185 feet southwest of fireplug near lane, in the NE¼SE¼ sec. 17, T. 37 N., R. 8 E.

Ap—0 to 8 inches, very dark gray (10YR 3/1) silt loam; moderate, very fine, granular structure; friable; slightly acid; abrupt, smooth boundary.

A3—8 to 11 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; neutral; clear, smooth boundary.

B21t—11 to 17 inches, dark-brown (10YR 4/3) silty clay loam; moderate, fine, subangular blocky structure; continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; medium acid; clear, smooth boundary.

B22t—17 to 25 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, medium, subangular blocky structure; thin, continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; strongly acid; clear, smooth boundary.

B23t—25 to 29 inches, dark-brown (7.5YR 4/4) clay loam; weak, coarse and medium, subangular blocky structure; continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; slightly acid; abrupt, smooth boundary.

IIR—29 inches, limestone bedrock; dolomitic; partly fractured; very little weathering.

The A horizon ranges from 10 to 16 inches in thickness and from black to very dark grayish brown in color. The B horizon ranges from 10 to 24 inches in thickness. In most areas it is silty clay loam in the upper part, but it ranges from clay loam to loam in the lower part. The solum ranges from 20 to 40 inches in thickness. The underlying limestone bedrock in most areas is flat bedded, unweathered, and fractured in only a few places.

Ripon soils are near Plattville soils. They are shallower to bedrock than Plattville soils.

Ripon silt loam, 1 to 4 percent slopes (324B).—This soil is associated with Plattville silt loam, 0 to 2 percent slopes, and Plattville silt loam, 2 to 4 percent slopes. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Plattville soils. Also included are areas where the surface layer is thinner than is typical for Ripon soils.

This soil is suited to small grains. Suitability for other crops is limited by the low available water capacity. Management group IIs-1.

Ripon silt loam, 4 to 7 percent slopes, eroded (324C2).—This soil is associated with Ripon and Plattville soils. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are somewhat thinner.

Included with this soil in mapping are small areas where the surface layer and subsoil are thinner than is typical of Ripon soils and small areas of soils that have slopes of more than 7 percent.

This soil is suited to small grain and meadow but only to an occasional crop of corn or soybeans. Most areas are used for crops or pasture. If the soil is farmed intensively, severe erosion is the major concern of management. Suitable erosion control practices are a necessary part of good management. Management group IIIs-1.

Rush Series

The Rush series consists of nearly level to gently sloping, well-drained soils. These soils are in somewhat narrow strips on the broad glacial outwash plain. The areas are parallel to the major stream channels and the Fox River. The soils formed in thin deposits of silt loam material and in the underlying stratified loamy, sandy, and gravelly material. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is very dark grayish-brown silt loam about 4 inches thick. The subsurface layer, about 9 inches thick, is dark grayish-brown silt loam. In cultivated areas the surface layer and the upper part of the subsurface layer are mixed. The subsoil is about 32 inches thick. The upper part is brown and dark yellowish-brown silty clay loam, and the lower part is dark yellowish-brown clay loam and brown gravelly clay loam. The underlying material is moderately alkaline, mixed yellowish-brown and pale-brown sand and gravel.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low. Rush soils are suited to all the commonly grown crops. Many areas are cultivated, and many areas that are adjacent to the drainageways and steeper soils are in pasture or woodland. Increasing the organic-matter content and protecting the moderately sloping soils from erosion are the major concerns of management.

Representative profile of Rush silt loam, 0 to 2 percent slopes, 45 feet north and 35 feet east of the center of the NW¼ sec. 15, T. 36 N., R. 6 E.

A1—0 to 4 inches, very dark grayish-brown (10YR 3/2) silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

A21—4 to 10 inches, dark grayish-brown (10YR 4/2) silt loam; weak, medium, platy structure parting to weak, fine, granular; friable; neutral; abrupt, smooth boundary.

A22—10 to 13 inches, dark grayish-brown (10YR 4/2) silt loam; moderate, thin, platy structure; friable; slightly acid; clear, smooth boundary.

B21t—13 to 19 inches, brown (10YR 5/3) light silty clay loam; moderate, very fine, subangular blocky structure; patchy coatings of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

B22t—19 to 27 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, medium, prismatic structure parting to moderate, very fine and fine, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

B23t—27 to 35 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings

of dark yellowish brown (10YR 3/4) on peds; firm; medium acid; clear, smooth boundary.

IIB24t—35 to 39 inches, dark yellowish-brown (10YR 3/4) clay loam; moderate, coarse, prismatic structure parting to moderate, medium, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; medium acid; clear, wavy boundary.

IIB3t—39 to 45 inches, brown (7.5YR 4/4) gravelly clay loam; moderate, coarse, prismatic structure parting to moderate, coarse, subangular; coatings of dark brown (7.5YR 3/2) on vertical ped surfaces; firm; medium acid; clear, wavy boundary.

IIC—45 to 52 inches, mixed yellowish-brown (10YR 5/4) and pale-brown (10YR 6/3) sand and gravel; single grained; moderately alkaline; strong effervescence.

The A horizon ranges from 8 to 15 inches in thickness. In plowed areas the Ap horizon ranges from dark grayish brown to brown. The upper part of the B horizon ranges from brown to yellowish-brown light silty clay loam to heavy silty clay loam. The lower part of the B horizon ranges from yellowish-brown to dark reddish-brown silty clay loam that has a gritty feel or clay loam to gravelly loam and loamy sand. The solum ranges from 42 inches to 55 inches in thickness. The C horizon is stratified sand and gravel.

Rush soils are associated with Waupecan, Dresden, and Fox soils. They have a lighter colored A horizon than Waupecan and Dresden soils. They have a thicker solum than Fox soils.

Rush silt loam, 0 to 2 percent slopes (791A).—This soil is in somewhat elongated areas that parallel the major drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are areas where the surface layer is darker colored than is typical for Rush soils. Also included are small areas of Fox silt loam, 1 to 4 percent slopes.

This Rush soil is suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Rush silt loam, 2 to 4 percent slopes (791B).—This soil is in small, irregularly shaped, higher areas of the outwash plain and short breaks that are somewhat parallel to the drainageways.

Included with this soil in mapping are areas where the surface layer is darker colored than is typical for Rush soils. Also included are small areas of Fox silt loam, 1 to 4 percent slopes.

This Rush soil is suited to the crops commonly grown in the county. Increasing the organic-matter content and overcoming the minor hazard of erosion are the main concerns of management. Management group IIe-1.

St. Charles Series

The St. Charles series consists of nearly level to moderately sloping, well drained and moderately well drained soils. These soils are on broad ridges and side slopes along the major drainageways in the northwestern part of the county, mainly on the east and north sides of creeks where the native woodland vegetation was protected from prairie fires. The soils formed in moderately thick deposits of silt loam material and in the underlying sandy loam till or stratified loamy glacial outwash. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is very dark gray silt loam about 4 inches thick. The subsurface layer, about 6 inches thick, is dark grayish-brown silt loam. In cultivated areas the surface layer and upper part of the subsurface layer are mixed. The subsoil, about 48 inches thick, is dark yellowish-brown silty clay loam in the upper 31 inches and dark yellowish-brown and yellowish-brown clay loam in the lower 17 inches. The underlying material is yellowish-brown sandy loam. It is moderately alkaline glacial drift.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low. St. Charles soils are suited to all the commonly grown crops. Most areas are cultivated, but many small areas that are adjacent to the drainageways and steep breaks are in pasture or woodland. Increasing the organic-matter content and controlling erosion are the major concerns of management.

Representative profile of St. Charles silt loam, 0 to 2 percent slopes, 75 feet east and 10 feet south of cornerpost, in the NW¼SW¼NW¼ sec. 34, T. 37 N., R. 6 E.

A1—0 to 4 inches, very dark gray (10YR 3/1) silt loam; moderate, fine, granular structure; friable; neutral; clear, smooth boundary.

A2—4 to 10 inches, dark grayish-brown (10YR 4/2) silt loam; weak, thin and medium, platy structure parting to moderate, fine, granular; friable; strongly acid; clear, smooth boundary.

B1—10 to 15 inches, dark yellowish-brown (10YR 4/4) light silty clay loam; moderate, very fine, subangular blocky structure; continuous coatings of dark brown (10YR 4/3) on ped faces; friable; strongly acid; clear, smooth boundary.

B21t—15 to 19 inches, dark yellowish-brown (10YR 4/4) silty clay loam; moderate, very fine, subangular blocky structure; continuous coatings of dark brown (10YR 4/3) on ped faces and patches of light-gray silt; firm; strongly acid; clear, smooth boundary.

B22t—19 to 32 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, fine, prismatic structure parting to moderate, very fine, subangular blocky; continuous coatings of dark brown (10YR 4/3) on ped faces and patches of light-gray silt; firm; very strongly acid; clear, smooth boundary.

B23t—32 to 41 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, moderate, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings of dark brown (7.5YR 4/4) and some patches of light-gray silt on ped faces; firm; very strongly acid; abrupt, smooth boundary.

IIB31—41 to 48 inches, dark yellowish-brown (10YR 4/4) clay loam; moderate, fine and medium, subangular blocky structure; coatings of dark brown (7.5YR 4/4) and patches of light-gray silt on ped faces; firm; strongly acid; clear, smooth boundary.

IIB32—48 to 58 inches, yellowish-brown (10YR 5/4) light clay loam; moderate, medium, subangular blocky structure; coatings of dark brown (7.5YR 4/4) in root channels; firm; slightly acid; abrupt, smooth boundary.

IIC—58 to 64 inches, yellowish-brown (10YR 5/4) sandy loam; massive; very friable; moderately alkaline; strong effervescence.

The A horizon ranges from 8 to 15 inches in thickness. In plowed areas the Ap horizon ranges from dark grayish brown to brown. The B2 horizon ranges from dark yellowish brown to brown and in places is mottled in the lower part. The B3 horizon ranges from silty clay loam that has a gritty feel to clay loam and sandy loam. The solum ranges from 45 inches to more than 60 inches in thickness. The C horizon has variable textures of sandy loam, silt loam, loam, sand, and in some places gravel.

St. Charles soils are near Kendall and Batavia soils and are similar to Camden soils. St. Charles soils are better drained than Kendall soils, and they have a lighter colored A horizon than Batavia soils. They contain less sand above a depth of 40 inches than Camden soils and less gravel in the C horizon than Rush soils.

St. Charles silt loam, 0 to 2 percent slopes (243A).—This soil is on broad ridges that are parallel to and between the large drainageways. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Batavia silt loam, 0 to 2 percent slopes. Also included are small areas where the lower part of the subsoil is mottled.

This soil is suited to the crops commonly grown in the

county. It can be cropped intensively. Management group I-1.

St. Charles silt loam, 2 to 4 percent slopes (243B).—This soil is on broad ridges along and between the major drainageways.

Included with this soil in mapping are small areas of Batavia silt loam, 0 to 2 percent slopes. Also included are small areas where the lower part of the subsoil is mottled and small areas that have a thinner surface layer and subsoil than are typical for St. Charles soils.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard, but the size of the areas and the irregular topography limit the use of erosion control practices. Management group IIe-1.

St. Charles silt loam, 4 to 7 percent slopes, eroded (243C2).—This soil is on side slopes above and adjacent to creeks and drainageways. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas where the underlying calcareous sandy loam drift is at a depth of less than 45 inches.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard where the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Sawmill Series

The Sawmill series consists of nearly level, poorly drained soils on bottom lands. These soils formed in water-laid silty clay loam sediments.

In a representative profile the surface layer is black light silty clay loam about 25 inches thick. The subsoil, about 32 inches thick, is very dark gray, dark-gray, and grayish-brown silty clay loam. Mottles of yellowish-brown are in the lower 27 inches. The underlying material is mixed yellowish-brown and grayish-brown, stratified sandy loam, loam, and clay loam.

Permeability is moderately slow, and the available water capacity is very high. The organic-matter content is high. Where practical to cultivate, Sawmill soils are well suited to corn and soybeans. Because of frequent flooding and narrow channels, many areas are in pasture or woodland. Stream overflow and a seasonal high water table are the major concerns of management (fig. 8).

Representative profile of Sawmill silty clay loam, 33 feet east of road center and 100 feet south of bridge rail, in the NW¼NW¼NW¼ sec. 8, T. 35 N., R. 8 E.

A1—0 to 16 inches, black (N 2/0) light silty clay loam; moderate, fine, granular structure; friable; mildly alkaline; gradual, smooth boundary.

A3—16 to 25 inches, black (N 2/0) light silty clay loam; weak, medium, subangular blocky structure and moderate, medium, granular; friable; mildly alkaline; clear, smooth boundary.

B21—25 to 30 inches, very dark gray (10YR 3/1) silty clay loam; moderate, medium, prismatic structure parting to moderate, fine, subangular blocky; continuous coatings of very dark gray (2.5Y 3/0) on peds; firm; mildly alkaline; clear, smooth boundary.

B22g—30 to 41 inches, dark-gray (2.5Y 4/0) silty clay loam; few, fine, faint, yellowish-brown (10YR 5/6) and dark-brown (10YR 4/3) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; continuous coatings of very dark gray (2.5Y 3/0) on peds; firm; mildly alkaline; gradual, smooth boundary.

B3g—41 to 57 inches, grayish-brown (2.5Y 5/2) silty clay loam; common, fine, distinct, yellowish-brown (10YR 5/6) mottles; moderate, coarse, prismatic structure parting to weak, coarse, subangular blocky; coatings of very dark gray (2.5Y 3/0) on vertical ped surfaces; firm; moderately alkaline; slight effervescence; gradual, smooth boundary.

C—57 to 73 inches, mixed yellowish-brown (10YR 5/6) and grayish-brown (2.5Y 5/2), stratified sandy loam, loam, and clay loam; massive; friable; moderately alkaline; slight effervescence.

The A horizon ranges from 24 to 30 inches in thickness and is light to heavy silty clay loam. The B horizon below a depth of 40 inches ranges from silty clay loam to clay loam. The solum ranges from 40 to 60 inches in thickness.

Sawmill soils formed in material similar to Drummer, Milford, and Peotone soils. They have a thicker A horizon and are more poorly drained than Drummer and Milford soils. They have a thicker A horizon and contain less clay in the B horizon than Peotone soils.

Figure 8.—**Yards and basements are subject to flooding in this area of Sawmill soils.**

Sawmill silty clay loam (0 to 2 percent slopes) (107).—This soil is in small areas of bottom lands that parallel stream channels.

Included with this soil in mapping are small areas that have a silty overwash and small areas that have less than 24 inches of surface layer.

This soil is suited to corn and soybeans. It can be intensively cropped where it is not subject to wetness. Flooding is a serious hazard, and adequate drainage is difficult. Management group IIw-2.

Saybrook Series

The Saybrook series consists of nearly level to moderately sloping, moderately well drained and well drained soils. These soils are in areas of undulating relief in the morainal areas. They formed in thin deposits of silt loam material and in the underlying silt loam and loam glacial till. The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark brown to very dark grayish-brown silt loam about 11 inches thick. The subsoil is about 34 inches thick. In sequence from the top, it is 26 inches of brown and yellowish-brown silty clay loam and 8 inches of brown silt loam. The underlying material is yellowish-brown, mottled silt loam that is high in content of sand. It is moderately alkaline glacial till.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Saybrook soils are well suited to all the commonly grown crops. Increasing the organic-matter content and protecting the gently sloping and moderately sloping soils from erosion are the major concerns of management.

Representative profile of Saybrook silt loam, 2 to 4 percent slopes, 276 feet south of east-west fence and 90 feet east of north-south fence, in the SW¼NE¼NE¼NE¼ sec. 25, T. 36 N., R. 6 E.

Ap—0 to 8 inches, very dark brown (10YR 2/2) silt loam; weak, medium, granular structure; friable; slightly acid; abrupt, smooth boundary.

A12—8 to 11 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine and medium, granular structure; friable, slightly acid; clear, smooth boundary.

B21t—11 to 19 inches, brown (10YR 4/3) silty clay loam; moderate, very fine, subangular blocky structure; firm; slightly acid; clear, smooth boundary.

B22t—19 to 28 inches, yellowish-brown (10YR 5/4) silty clay loam; moderate, fine and medium, subangular blocky structure that has coatings of dark yellowish brown (10YR 4/4); firm; medium acid; clear, smooth boundary.

IIB23t—28 to 37 inches, brown (10YR 5/3) silty clay loam that has a noticeable sand content; many, fine, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine, subangular blocky that has continuous coatings of dark grayish brown (10YR 4/2); firm; mildly alkaline; few till pebbles; clear, smooth boundary.

IIB3—37 to 45 inches, brown (10YR 5/3) silt loam that has a high sand content; weak, medium, prismatic structure parting to weak, coarse, subangular blocky that has some coatings of dark grayish brown (10YR 4/2); friable; moderately alkaline; slight effervescence; gradual, wavy boundary.

IIC—45 to 57 inches, yellowish-brown (10YR 5/4) silt loam that has a high sand content; many, medium, distinct, grayish-brown (10YR 5/2) and yellowish-brown (10YR 5/6) mottles; massive; friable; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 15 inches in thickness and is black to very dark grayish brown. The B2 horizon is mainly silty clay loam but ranges to clay loam in the lower part. The B3 horizon ranges from silty clay loam to clay loam or silt loam. In most places the solum is 30 to 50 inches thick. The C horizon is silt loam or loam glacial till that has varying amounts of pebbles, stones, and boulders.

In Kendall County the Saybrook soils have IIB and IIC horizons that contain less sand than is within the defined range for the series. This difference does not alter the usefulness and behavior of these soils.

Saybrook soils are associated with Lisbon, Drummer, and La Rose soils. They are better drained than Lisbon and Drummer soils and have a thicker solum than La Rose soils.

Saybrook silt loam, 0 to 2 percent slopes (145A).—This soil is in broad, irregularly shaped areas in the morainal parts of the county. The soil has a profile similar to the one described as representative of the series, but the surface layer is thicker.

Included with this soil in mapping are small areas of Lisbon silt loam and small areas that have some stratified silt and sand just above the underlying material.

This Saybrook soil is suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Saybrook silt loam, 2 to 4 percent slopes (145B).—This soil is on broad, irregularly shaped ridgetops in the morainal parts of the county. The soil has the profile described as representative of the series.

Included with this soil in mapping are small areas of nearly level soils and small areas where the surface layer is thinner than is typical for Saybrook soils. Also included are small areas of soils that have some stratified silt and sand just above the underlying material.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard. Where they are practical to install, erosion control structures help reduce soil losses. Management group IIe-1.

Saybrook silt loam, 2 to 4 percent slopes, eroded (145B2).—This soil is on small, somewhat rounded rises. It has a profile similar to the one described as representative of the series, but the surface layer is thinner. In most areas plowing mixes subsoil material into the surface layer.

Included with this soil in mapping are small areas of La Rose silt loam, 2 to 4 percent slopes, eroded.

This Saybrook soil is suited to the crops commonly grown in the county. Erosion is the major hazard, and special management practices should be used. Management group IIe-1.

Saybrook silt loam, 4 to 7 percent slopes, eroded (145C2).—This soil is in the morainal areas of the county. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing mixes subsoil material into the surface layer.

Included with this soil in mapping are small areas of La Rose silt loam, 4 to 7 percent slopes, eroded, and small areas where slopes are less than 4 percent.

This Saybrook soil is suited to the crops commonly grown in the county. Erosion is a hazard if the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Sparta Series

The Sparta series consists of gently sloping to strongly sloping, excessively drained, sandy soils on terraces along the Fox River. These soils formed in water-laid sandy sediments.

In a representative profile the surface layer is very dark grayish-brown loamy fine sand about 11 inches thick. The subsoil is brown and strong-brown loamy sand and sand about 24 inches thick. The underlying material is yellowish-brown, loose sand.

Permeability is very rapid, and the available water capacity and organic-matter content are low. Sparta soils are better suited to small grains and meadow than to corn and soybeans. Plantings of pine trees do well on these soils.

Representative profile of Sparta loamy fine sand, 3 to 10 percent slopes, 25 feet south of lane center and 180 feet west of field boundary, in the SW¼NW¼NW¼ sec. 31, T. 36 N., R. 6 E.

A—0 to 11 inches, very dark grayish-brown (10YR 3/2) light loamy fine sand; weak, fine and medium, granular structure parting to single grained; very friable; neutral; clear, smooth boundary.

B21—11 to 17 inches, brown (7.5YR 4/4) light loamy sand; single grained; loose; medium acid; gradual, wavy boundary.

B22—17 to 35 inches, strong-brown (7.5YR 5/6) sand; single grained; loose; medium acid; gradual, wavy boundary.

C—35 to 60 inches, yellowish-brown (10YR 5/4) sand; single grained; loose; slightly acid.

The A horizon ranges from 10 to 16 inches in thickness. The solum ranges from 24 to 40 inches in thickness. Sparta soils are minor in extent.

Sparta soils are adjacent to areas of Dresden soils. They are coarser textured in the A and B horizons than Dresden soils.

Sparta loamy fine sand, 3 to 10 percent slopes (88C).—This soil is on somewhat elongated ridges in the river valley.

Included with this soil in mapping are small areas that have a thinner surface layer than is typical for Sparta soils. Also included are areas that have weak subsoil development.

This soil is droughty and is used mostly for pasture or is left idle. Management group IIIs-1.

Strawn Series

The Strawn series consists of moderately sloping to steep, well-drained soils. These soils occur with Dodge soils on rolling relief in the morainal areas and along the steep sides of the Fox River Valley. They formed in very thin deposits of silt loam material and in the underlying silt loam and loam glacial till. The native vegetation was mixed hardwood trees.

In a representative profile the surface layer is dark grayish-brown silt loam about 5 inches thick. The subsoil is about 16 inches thick. It is brown silty clay loam in the upper part and brown silt loam in the lower part. The underlying material is mixed brown, yellowish-brown, and grayish-brown silt loam that has a high content of sand. It is moderately alkaline glacial till.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low. Strawn soils are suited to all the commonly grown crops. Protection from erosion and increasing the organic-matter content are the major concerns of management.

Representative profile of Strawn silt loam, 7 to 15 percent slopes, eroded, 70 feet east of road center and 110 feet north of fence corner across the road, in the NW¼SW¼NW¼ sec. 8, T. 36 N., R. 7 E.

Ap—0 to 5 inches, dark grayish-brown (10YR 4/2) heavy silt loam; moderate, fine, granular structure; friable; neutral; abrupt, smooth boundary.

B21t—5 to 10 inches, brown (10YR 4/3) silty clay loam; moderate, fine and medium, subangular blocky structure; coatings of dark brown (10YR 3/3) on peds; firm; neutral; clear, smooth boundary.

IIB22t—10 to 16 inches, brown (10YR 4/3) silty clay loam that has a high content of sand; moderate, medium, subangular blocky structure; coatings of dark grayish brown on peds; firm; common till pebbles; mildly alkaline; clear, smooth boundary.

IIB3—16 to 21 inches, brown (10YR 5/3) silt loam that has a high content of sand; weak, medium, subangular blocky structure; discontinuous coatings of dark grayish brown on peds; firm; many till pebbles; mildly alkaline; gradual, smooth boundary.

IIC—21 to 50 inches, mixed brown (10YR 5/3), yellowish-brown (10YR 5/6), and grayish-brown (10YR 5/2) silt loam that has a high content of sand; massive; firm; moderately alkaline; strong effervescence; many glacial till pebbles and stones.

The A horizon ranges from 4 to 8 inches in thickness. The Ap horizon ranges from dark grayish-brown to brown silt loam to heavy silt loam that has a high content of sand. In some places there is an A2 horizon of grayish-brown to pale-brown silt loam. The B horizon is 8 inches or more thick and is brown to yellowish-brown silty clay loam or clay loam to heavy silt loam or heavy loam. The solum ranges from 12 to 24 inches in thickness. The C horizon is silt loam or loam that contains varying amounts of glacial stones and boulders.

In Kendall County, Strawn soils have IIB and IIC horizons that contain less sand than is within the defined range for the series. This difference does not alter the usefulness and behavior of these soils.

Strawn soils are associated with Dodge and Hennepin soils. They have a thinner solum than Dodge soils and a thicker solum than Hennepin soils.

Strawn silt loam, 4 to 7 percent slopes (224C).—This soil is on small, irregularly shaped ridges or moderately sloping side slopes to drainageways in the morainal parts of the county. It has a profile similar to the one described as representative of the series, but the surface layer is thicker. Also, it has a subsurface layer.

Included with this soil in mapping are small areas where slopes are less than 4 percent and small areas where the surface layer and subsoil are thicker than is typical for Strawn soils.

This soil is suited to the commonly grown crops, but in most areas it is in pasture or woodland. The areas are small and are associated with steep soils. They should be used as the surrounding soil areas are used. Management group IIe-1.

Strawn silt loam, 4 to 7 percent slopes, eroded (224C2).—This soil is on ridges and side slopes in the more rolling morainal parts of the country. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas of Dodge silt loam, 4 to 7 percent slopes, eroded. Also included are small areas of severely eroded soils. In the southeastern corner of Bristol Township are included areas of soils that have a finer textured subsoil than is typical for Strawn soils.

This soil is suited to the crops commonly grown in the county. Erosion is a severe hazard where the soil is cropped intensively. Erosion control practices that are suited to the topography reduce soil and water losses. Management group IIe-1.

Strawn silt loam, 7 to 15 percent slopes, eroded (224D2).—This soil is on the sides of ridges in the morainal parts of the county. It has the profile described as representative of the series. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small areas of severely eroded soils and small areas of soils that have slopes of less than 7 percent.

This soil is suited to the commonly grown crops if erosion control practices are used and cropping is not intensive. Suitable management practices reduce losses of soil and water. Areas of this soil that are in pasture or woodland should be maintained. Management group IIIe-1.

Strawn silt loam, 15 to 30 percent slopes (224F).—This soil is on long, narrow breaks from the glacial till areas to the Fox River Valley. It has a profile similar to the one described as representative of the series, but in most places, the surface layer and subsoil are thinner.

Included with this soil in mapping are small areas of Hennepin silt loam, 15 to 30 percent slopes, and areas of soils that are more sandy or more gravelly than is typical for Strawn soils. Also included are small eroded or severely eroded areas.

This soil is suited to pasture or woodland. Erosion is a serious concern of management for any use. Woodland areas should be maintained. Management group VI.

Strawn soils, 4 to 7 percent slopes, severely eroded (224C3).—These soils are on side slopes in the morainal parts of the county. They have a surface layer that is mostly or entirely subsoil material.

Included with these soils in mapping are small areas of soils that are not severely eroded and areas of soils that have a thinner surface layer and subsoil than are typical of Strawn soils.

These soils are suited to occasional cropping if erosion is adequately controlled. Controlling erosion is a necessary part of good management. Management group IIIe-1.

Strawn soils, 7 to 12 percent slopes, severely eroded (224D3).—These soils are on the sides of ridges and mounds in the morainal parts of the county. They have a surface layer that is mostly or entirely subsoil material.

Included with these soils in mapping are areas where the surface layer and subsoil are thinner than is typical for this soil and small areas where slopes are less than 7 percent.

These soils are suited to hay and pasture, but to only occasional cropping. Erosion is a serious hazard. Suitable management practices help reduce soil and water losses. Management group IVe-1.

Swygert Series

The Swygert series consists of nearly level to moderately sloping, somewhat poorly drained soils. These soils are at a somewhat higher elevation in the level glacial lakebed areas in the southeastern part of the county. They formed in silty clay to clay lakebed sediment. The native vegetation was prairie grasses.

In a representative profile the surface layer is black silty clay loam about 13 inches thick. The subsoil is about 28 inches thick. In sequence from the top, the upper 12 inches is dark grayish-brown and grayish-brown silty clay, the next 7 inches is gray heavy silty clay, and the lower 9 inches is mixed dark grayish-brown and grayish-brown heavy silty clay. The underlying material is mixed dark grayish-brown and grayish-brown light clay. It is moderately alkaline lakebed sediment.

Permeability is slow, and the available water capacity is high. The organic-matter content is moderate. Swygert soils are well suited to all the commonly grown crops. Most areas are farmed intensively and used for corn and soybeans. Increasing the organic-matter content, providing adequate drainage, and controlling erosion on the sloping soils are the major concerns of management.

Representative profile of Swygert silty clay loam, 0 to 2 percent slopes, 30 feet north and 1,300 feet east of the southwest corner of sec. 25, T. 35 N., R. 7 E.

Ap—0 to 8 inches, black (10YR 2/1) light silty clay loam; weak, fine, granular structure; firm; neutral; abrupt, smooth boundary.

A3—8 to 13 inches, black (10YR 2/1) silty clay loam; moderate, fine, granular structure; firm; neutral; clear, smooth boundary.

B21t—13 to 20 inches, dark grayish-brown (10YR 4/2) light silty clay; moderate, fine, subangular blocky structure; firm; neutral; clear, smooth boundary.

B22t—20 to 25 inches, grayish-brown (2.5Y 5/2) silty clay; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky; coatings of dark grayish brown (2.5Y 4/2) on peds; firm; slightly acid; abrupt, smooth boundary.

B23t—25 to 32 inches, gray (2.5Y 5/0) heavy silty clay; many, medium, distinct, olive (5Y 4/3) mottles; moderate, medium, prismatic structure parting to moderate, medium, angular blocky; coatings of dark gray (5Y 4/1) to very dark gray (5Y 3/1) on peds; very firm; neutral; clear, wavy boundary.

B3—32 to 41 inches, mixed dark grayish-brown (10YR 4/2) and grayish-brown (10YR 5/2) heavy silty clay; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; coatings of gray (5Y 5/1) on peds; very firm; moderately alkaline; slight effervescence; gradual, wavy boundary.

C—41 to 66 inches, mixed dark grayish-brown (10YR 4/2) and grayish-brown (10YR 5/2) light clay; weak, coarse, prismatic structure and massive; coatings of gray (5Y 5/1) on peds; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 14 inches in thickness and from black to very dark gray in color. The B horizon ranges from dark grayish-brown to grayish-brown and gray heavy silty clay loam to clay and includes some greenish-gray colors in the lower part. In most places the solum ranges from 30 to 50 inches in thickness. The C horizon is variable thicknesses of silty clay, clay, and silty clay loam lakebed sediments. In many areas strata of sand and gravel are 6 to 8 feet below the surface.

Swygert soils are associated with the poorly drained Bryce soils. They are in positions similar to those of Martinton soils, but they contain more clay throughout the solum.

Swygert silty clay loam, 0 to 2 percent slopes (91A).—This soil is in broad, irregularly shaped areas at higher elevations in the nearly level glacial lakebed areas. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Bryce silty clay and Martinton silt loam, 0 to 2 percent slopes. Also included are areas of soils that have a more gray colored surface layer. Distinct gray spots are shown on the detailed soil map by the conventional symbol.

A periodic high water table and slow permeability are serious limitations to the use of this soil. Artificial drainage is needed for good management. Management group IIw-4.

Swygert silty clay loam, 2 to 4 percent slopes (91B).—This soil is in irregularly shaped areas between broad flat areas and areas of poorly drained Bryce soils in the lakebed parts of the county. The soil has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner.

Included with this soil in mapping are small areas of Swygert silty clay loam, 0 to 2 percent slopes, and small eroded areas.

Slow permeability, wetness in spring, and the hazard of erosion are the major concerns of management. Erosion control practices and drainage are generally needed to reduce soil losses and obtain optimum crop response. Management group IIe-2.

Swygert silty clay loam, 3 to 7 percent slopes, eroded (91C2).—This soil is on the sharper breaks into drainageways and into areas of Bryce soils in the glacial lakebed parts of the county. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are small severely eroded areas and small areas where slopes are more than 7 percent.

This soil is suited to cropping if erosion is adequately controlled. Erosion control is a necessary part of good management. Management group IIIe-2.

Thorp Series

The Thorp series consists of nearly level to depressional, poorly drained soils. These soils are mainly in the northern part of the county. They formed in moderately thick and thin deposits of silt loam material and in the underlying medium-textured glacial till. The native vegetation was prairie grasses that were adapted to wet conditions.

In a representative profile the surface layer is very dark gray silt loam about 11 inches thick. The subsurface layer is dark grayish-brown silt loam about 4 inches thick. The subsoil is about 50 inches thick. In sequence from the top, it is 6 inches of grayish-brown light silty clay loam, 21 inches of gray silty clay loam, and 23 inches of mixed gray and yellowish-brown silt loam and loam. The underlying material is mixed grayish-brown and brown loam and sandy loam.

Permeability is slow, and the available water capacity is high. The organic-matter content is moderate. If adequately drained, Thorp soils are suited to the commonly grown crops. Maintaining adequate drainage with tile and shallow surface ditches is the major concern of management.

Representative profile of Thorp silt loam, 39 feet north of road center and 110 feet west of farmstead fence, in the NE¼NW¼SW¼NE¼ sec. 2, T. 37 N., R. 6 E.

A1—0 to 11 inches, very dark gray (10YR 3/1) silt loam; moderate, fine, granular structure; friable; mildly alkaline; clear, smooth boundary.

A2—11 to 15 inches, dark grayish-brown (10YR 4/2) silt loam; weak, coarse, platy structure parting to weak, very fine, granular structure that has stains of very dark gray (10YR 3/1); friable; neutral; clear, smooth boundary.

B1—15 to 21 inches, grayish-brown (10YR 5/2) light silty clay loam; weak, very fine, subangular blocky structure; stains of dark grayish brown (10YR 4/2); friable; medium acid; clear, smooth boundary.

B21t—21 to 32 inches, gray (5Y 5/1) silty clay loam; many, medium, prominent, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky; continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; medium acid; clear, smooth boundary.

B22tg—32 to 42 inches, gray (5Y 5/1) light silty clay loam; many, fine, prominent, yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to moderate, coarse, angular blocky; continuous thin coatings of grayish brown (10YR 5/2) on peds; firm; medium acid; clear, smooth boundary.

B31g—42 to 53 inches, mixed gray (5Y 5/1) and yellowish-brown (10YR 5/8) silt loam; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; patchy coatings of grayish-brown (10YR 5/2) clay on peds; friable; medium acid; abrupt, smooth boundary.

IIB32g—53 to 65 inches, mixed gray (2.5Y 5/0) and yellowish-brown (10YR 5/8) loam grading to clay loam in the lower 2 inches; weak, coarse, prismatic structure parting to weak, coarse, angular blocky; patchy ped coatings of dark gray that are very thick at the base; friable; slightly acid; clear, smooth boundary.

IIC1—65 to 92 inches, mixed grayish-brown (10YR 5/2) and brown (10YR 4/3) heavy loam; massive (with laminae); friable; many concretions of iron and manganese; mildly alkaline; gradual, smooth boundary.

IIC2—92 to 97 inches, mixed brown (10YR 5/3), grayish-brown (10YR 5/2), and yellowish-brown (10YR 5/6) sandy loam; many stones; massive; weakly calcareous.

The A horizon ranges from 14 to 18 inches in thickness, but thickness of the A2 horizon is variable. The B horizon is 40 to 55 inches thick, and it ranges from silt loam to sandy loam or loam in the lower part. The solum ranges from 45 to 70 inches in thickness. In most places the underlying material is stratified. In places it contains layers of loamy sand, sand, or gravelly material.

Thorp soils are associated with Brenton, Knight, and Millbrook soils. They are not so well drained as Brenton and Millbrook soils. They have a thicker A horizon than Knight soils.

Thorp silt loam (0 to 2 percent slopes) (206).—This nearly level soil is in shallow depressions that are widely scattered throughout areas of generally level soils.

Included with this soil in mapping are small areas where the surface layer is thinner than the one in this soil, and areas where plowing has mixed material from the subsurface layer into the plow layer. Also included are areas where the underlying material is mainly sand and gravel.

This soil is suited to the crops commonly grown in the county. It can be intensively cropped. The seasonal high water table and hazard of ponding are the major concerns of management. Management group IIw-1.

Varna Series

The Varna series consists of gently sloping to strongly sloping, moderately well drained soils. These soils are on undulating to rolling relief on the glacial moraines in the southeastern and southwestern parts of the county. They formed in thin deposits of silt loam material and in the underlying silty clay loam glacial till. The native vegetation was prairie grasses.

In a representative profile the surface layer is black to very dark gray silt loam about 13 inches thick. The subsoil is about 22 inches thick. In sequence from the top, it is 9 inches of dark yellowish-brown silty clay and 13 inches of brown heavy silty clay loam and silty clay loam. The lower part of the subsoil has yellowish-brown and grayish-brown mottles, and small till pebbles occur throughout the profile. The underlying material is moderately alkaline, brown and grayish-brown silty clay loam glacial till.

Permeability is moderately slow, and the available water capacity is high. The organic-matter content is moderate. Gently sloping and moderately sloping Varna soils are suited to crops. Areas of strongly sloping Varna soils and some areas of moderately sloping Varna soils are better suited to grass and legume crops than to most other uses. Increasing the organic-matter content, improving the tilth, and controlling erosion are the major concerns of management.

Representative profile of Varna silt loam, 1 to 4 percent slopes, 100 feet west of road center and 100 feet south of lane, in the NE¼SE¼SE¼ sec. 35, T. 35 N., R. 8 E.

Ap—0 to 7 inches, black (10YR 2/1) silt loam; moderate, very fine, granular structure; friable; neutral; abrupt, smooth boundary.

A3—7 to 13 inches, very dark gray (10YR 3/1) heavy silt loam; strong, very fine, granular structure; firm; neutral; clear, smooth boundary.

IIB21t—13 to 22 inches, dark yellowish-brown (10YR 4/4) silty clay; weak, fine, prismatic structure parting to strong, very fine, subangular blocky; continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; slightly acid; clear, smooth boundary.

IIB22t—22 to 29 inches, brown (10YR 5/3) heavy silty clay loam; many, fine, faint, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to strong, fine, subangular blocky; continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; slightly acid; clear, wavy boundary.

IIB3—29 to 35 inches, brown (10YR 5/3) silty clay loam; many, medium, distinct, grayish-brown (10YR 5/2) mottles and many, fine, faint, yellowish-brown (10YR 5/6) mottles; moderate, medium, prismatic structure parting to moderate, medium, subangular blocky; firm; moderately alkaline; slight effervescence; gradual, wavy boundary.

IIC—35 to 50 inches, brown (10YR 5/3) silty clay loam; common, medium, distinct, grayish-brown (10YR 5/2) mottles and common, fine, faint, yellowish-brown (10YR 5/4) mottles; massive; firm; moderately alkaline; strong effervescence.

The A horizon ranges from 10 to 15 inches in thickness and from black to very dark grayish brown. The B2 horizon ranges from dark yellowish-brown to grayish-brown heavy silty clay loam to silty clay. In most places the solum ranges from 24 to 48 inches in thickness. The C horizon is silty clay loam that contains varying amounts of glacial stones and boulders.

In Kendall County the eroded Varna soils have a thinner, lighter colored surface layer than is within the defined range for the series. This difference alters the usefulness and behavior of these soils.

Varna soils occur with Saybrook and La Rose soils. They contain more clay in the B and C horizons than Saybrook and La Rose soils.

Varna silt loam, 1 to 4 percent slopes (223B).—This soil is on small, irregularly shaped ridges in the morainal parts of the county. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of nearly level soils that have a more gray colors in the subsoil

than is typical for Varna soils. Also included are small areas where the surface layer is thinner and lighter colored than is typical for Varna soils.

This soil is suited to the crops commonly grown in the county. Erosion is a hazard. Erosion control practices are needed to reduce soil losses. Management group IIe-2.

Varna silt loam, 4 to 7 percent slopes, eroded (223C2).—This soil is on side slopes in the morainal parts of the county. It has a profile similar to the one described as representative of the series, but the surface layer and subsoil are thinner. In most areas, plowing has mixed subsoil material into the surface layer.

Included with this soil in mapping are many severely eroded areas.

This soil is suited to crops if erosion is adequately controlled. Erosion control is a necessary part of good management. Management group IIIe-2.

Varna soils, 7 to 15 percent slopes, severely eroded (223D3).—These soils are on side slopes that face drainageways in the morainal parts of the county. They have a profile similar to the one described as representative of the series, but the surface layer is mostly or entirely brown silty clay loam subsoil material.

Included with this soil in mapping are a few small areas where slopes are more than 15 percent.

These soils are suited to hay, pasture, and woodland. Erosion is a serious hazard. Suitable management practices help reduce soil and water losses. Management group IVe-1.

Virgil Series

The Virgil series consists of nearly level, somewhat poorly drained soils. These soils are in broad, level areas that are adjacent to the major drainageways in the northwestern part of the county. They formed in moderately thick deposits of silt loam material and in the underlying sandy loam till or stratified loamy glacial outwash. The native vegetation was mixed prairie grasses and hardwood trees.

In a representative profile the surface layer is black silt loam about 9 inches thick. The subsurface layer, about 5 inches thick, is dark grayish-brown silt loam. The subsoil is about 48 inches thick. In sequence from the top, the upper 5 inches is dark grayish-brown silty clay loam; the next 22 inches is brown or grayish-brown silty clay loam; the next 6 inches is mixed yellowish-brown and grayish-brown clay loam; and the lower 15 inches is yellowish-brown stratified silt loam and sandy loam. It is moderately alkaline glacial drift.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Virgil soils are well suited to the commonly grown crops. Most areas are farmed intensively and used for corn and soybeans. Some areas need additional artificial drainage if they are to be cultivated early in spring.

Representative profile of Virgil silt loam, 18 feet south of road center and 200 feet east of cornerpost, in the NW¼ NW¼NE¼NW¼ sec. 6, T. 37 N., R. 7 E.

A1—0 to 9 inches, black (10YR 2/1) silt loam; moderate, fine, granular structure; friable; mildly alkaline; clear, smooth boundary.

A2—9 to 14 inches, dark grayish-brown (10YR 4/2) silt loam; weak, thick, platy structure parting to weak, medium, granular; continuous organic coatings of very dark gray (10YR 3/1) on peds; friable; neutral; clear, smooth boundary.

B1—14 to 19 inches, dark grayish-brown (10YR 4/2) light silty clay loam; common, medium, faint, yellowish-brown (10YR 5/4) mottles; moderate, very fine, subangular blocky structure; continuous organic coatings of very dark gray (10YR 3/1) on peds; friable; neutral; clear, smooth boundary.

B21t—19 to 27 inches, brown (10YR 5/3) silty clay loam; common, medium, faint, yellowish-brown (10YR 5/6) and grayish-brown (10YR 5/2) mottles; moderate, very fine, subangular blocky structure; continuous coatings of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

B22t—27 to 35 inches, grayish-brown (10YR 5/2) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles and common, medium, faint, light brownish-gray (10YR 6/2) mottles; weak, medium, prismatic structure parting to moderate, fine, subangular blocky; vertical coatings of dark grayish brown (10YR 4/2) on peds; firm; slightly acid; clear, smooth boundary.

B23t—35 to 41 inches, grayish-brown (10YR 5/2) silty clay loam; many, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, medium, prismatic structure parting to moderate, fine to medium, subangular blocky; firm; slightly acid; abrupt, smooth boundary.

IIB24t—41 to 47 inches, mixed yellowish-brown (10YR 5/8) and grayish-brown (10YR 5/2) clay loam; weak, coarse, prismatic structure parting to weak, coarse, subangular blocky; patchy coatings of very dark gray (10YR 3/1) on peds; firm; slightly acid; clear, smooth boundary.

IIB3—47 to 62 inches, yellowish-brown (10YR 5/8) stratified loam, silty clay loam, and silt loam; many, coarse, distinct, grayish-brown (10YR 5/2) mottles; weak, coarse, subangular blocky structure; black (10YR 2/1) root channels; firm; neutral; clear, smooth boundary.

IIC—62 to 80 inches, yellowish-brown (10YR 5/4) silt loam and thin strata of sandy loam; massive; common small stones; moderately alkaline.

The A horizon ranges from 12 to 17 inches in thickness. The A1 horizon is black to very dark grayish brown. The A2 horizon is dark grayish brown to grayish brown. The B horizon is mainly silty clay loam above a depth of 40 inches but ranges to clay loam and sandy clay loam. Mottles of yellowish brown and light brownish gray are variable throughout the B horizon. As the site is near a gravel road, the pH values are higher than normal for this soil. The solum ranges from 45 to more than 60 inches in thickness. The underlying material has variable textures of sandy loam, silt loam, loam, sand, and in some places gravel.

Virgil soils are near Batavia, Kendall, and Plano soils. They are more poorly drained than Batavia and Plano soils. They have a darker colored, thicker A1 horizon than Kendall soils and are not so dark as Plano soils.

Virgil silt loam (0 to 2 percent slopes) (104).—This soil is in irregularly shaped areas that are at a somewhat lower elevation than the surrounding soils.

Included with this soil in mapping are small areas of Kendall silt loam and Elburn silt loam. Also included are small areas of Batavia silt loam, 0 to 2 percent slopes.

A periodic high water table is the most serious limitation to the use of this soil. In many places artificial drainage is needed for good management. Management group I-2.

Waupecan Series

The Waupecan series consists of nearly level to gently sloping, well-drained soils. These soils are on broad, large glacial outwash plains that parallel the Fox River and Blackberry Creek. They formed in thin deposits of silt loam material and in the underlying stratified sand and gravel (fig. 9). The native vegetation was prairie grasses.

In a representative profile the surface layer is very dark brown and very dark grayish-brown silt loam about 12 inches thick. The subsoil is about 33 inches thick. In sequence from the top, it is 9 inches of dark-brown and dark yellowish-brown silty clay loam, 11 inches of yellowish-brown and

Figure 9.—**Stratified sand and gravel underlie Waupecan soils.**

brown silty clay loam, and 13 inches of brown loam and dark reddish-brown sandy loam and loamy sand. Gravel is common throughout the lower part of the subsoil. The underlying material is moderately alkaline, pale-brown and yellowish-brown sand and gravel.

Permeability is moderate, and the available water capacity is high. The organic-matter content is moderate. Waupecan soils are well suited to all the commonly grown crops. Most areas are farmed intensively and used for corn and soybeans. Increasing the organic-matter content is the most serious concern of management.

Representative profile of Waupecan silt loam, 0 to 2 percent slopes, 885 feet northeast of road center and 105 feet south of fence line on west side of road, in the NW¼SE¼ SW¼SW¼ sec. 14, T. 37 N., R. 7 E.

Ap—0 to 9 inches, very dark brown (10YR 2/2) silt loam; weak, very fine and fine, granular structure; friable; slightly acid; abrupt, smooth boundary.

A3—9 to 12 inches, very dark grayish-brown (10YR 3/2) silt loam; weak, fine, granular structure; friable; slightly acid; clear, smooth boundary.

B21t—12 to 17 inches, dark-brown (10YR 4/3) light silty clay loam; moderate, very fine, subangular blocky structure; continuous coatings of very dark grayish brown (10YR 3/2) on peds; firm; medium acid; clear, smooth boundary.

B22t—17 to 21 inches, dark yellowish-brown (10YR 4/4) silty clay loam; weak, fine, prismatic structure parting to moderate, very fine, subangular blocky; continuous coatings of dark brown (10YR 4/3) on peds; firm; medium acid; clear, smooth boundary.

B23t—21 to 25 inches, yellowish-brown (10YR 5/4) silty clay loam; weak, medium, prismatic structure parting to moderate, very fine, subangular blocky; coatings of dark brown (10YR 4/3) on peds; firm; medium acid; clear, smooth boundary.

IIB24t—25 to 32 inches, brown (10YR 5/3) silty clay loam that has a noticeable content of sand; few, fine, faint, yellowish-brown (10YR 5/6) and grayish-brown (10YR 5/2) mottles; weak, medium, prismatic structure parting to moderate, fine and medium, subangular blocky; coatings of dark grayish brown (10YR 4/2) on peds; firm; medium acid; abrupt, smooth boundary.

IIB31—32 to 36 inches, brown (10YR 5/3) loam; weak, medium, prismatic structure parting to weak, medium and coarse, subangular blocky; coatings of dark brown (7.5YR 4/4) on peds; friable; medium acid; clear, smooth boundary.

IIB32—36 to 43 inches, dark reddish-brown (5YR 3/3) and dark-brown (7.5YR 3/4) sandy loam; weak, medium, prismatic structure parting to single grained; very friable; medium acid; clear, smooth boundary.

IIB33—43 to 45 inches, dark-brown (7.5YR 4/4) loamy sand; single grained; loose; neutral; abrupt, smooth boundary.

IIC—45 to 52 inches, pale-brown (10YR 6/3) and yellowish-brown (10YR 5/6) sand and gravel; single grained; loose; moderately alkaline.

The A horizon ranges from 10 to 16 inches in thickness. The upper part of the B horizon ranges from dark-brown to yellowish-brown light silty clay loam to heavy silty clay loam. The lower part of the B horizon ranges from yellowish-brown to dark reddish-brown silty clay loam that has a gritty feel or clay loam to gravelly loam and loamy sand. The solum ranges from 42 inches to 55 inches in thickness. The underlying material is stratified sand and gravel.

Waupecan soils are near Rush and Dresden soils. They have a thicker, darker colored A1 horizon than Rush or Dresden soils.

Waupecan silt loam, 0 to 2 percent slopes (369A).—This soil is in large areas that have no drainage pattern. It has the profile described as representative of the series.

Included with this soil in mapping are small areas where the lower part of the subsoil is mottled and areas where the combined surface layer and subsoil are thinner than is typical of Waupecan soil. Small depressions are shown on the detailed soil map by the conventional symbol.

This soil is well suited to the crops commonly grown in the county. It can be cropped intensively. Management group I-1.

Waupecan silt loam, 2 to 4 percent slopes (369B).—This soil is on small, irregularly shaped mounds and short breaks to major drainageways.

Included with this soil in mapping are small areas where the surface layer is thinner than is typical for Waupecan soils. Also included are small areas of Dresden silt loam, 2 to 4 percent slopes.

This soil is suited to the crops commonly grown in the county. Erosion is a minor hazard that can be overcome by good management practices. Management group IIe-1.

Use and Management of the Soils

In the following pages the general management of cropland in Kendall County is discussed, the capability grouping used by the Soil Conservation Service is explained, and management groups of soils are described. The predicted yields of principal crops under a high level of management are given. Also discussed is the use of soils for woodland, recreational developments, and wildlife. The soil properties and features that affect engineering practices are listed, mainly in tables.

General Management of Cropland

About 82 percent of Kendall County is cultivated. Corn and soybeans are the main crops. Wheat, oats, and grass-legume hay are other important crops.

The main considerations in managing cultivated soils in this county are controlling erosion, overcoming the wetness hazard, protecting from flooding, conserving moisture, and maintaining tilth and fertility.

Measures that help control erosion include terracing, contour farming, minimum tillage, cover crops, grassed waterways, and crop residue. Generally, a combination of several measures is used.

Measures that help overcome wetness include tile drains, shallow surface ditches, surface inlets to tile drains, drainage ditches, and diversions. Levees can help protect against floods.

Conserving moisture generally means reducing evaporation, limiting runoff, increasing infiltration, and controlling weeds. Practices that help do this include minimum tillage, crop residue, contour farming, stripcropping, and field windbreaks.

Applying chemical fertilizer, green manure, and barnyard manure and including cover crops, grasses, and legumes in the cropping system help maintain tilth and fertility. Crops respond well to fertilizer on all soils used for crops.

Lime is needed periodically on most soils. Soils on bottom lands and the Harpster soils are neutral or calcareous and do not need lime. Controlling erosion also helps conserve fertility and maintain tilth.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when they are used for other purposes, but this classification is not a substitute for interpretations designed to show the suitability and limitations of groups of soils for forest trees or for engineering.

In the capability system, the kinds of soils are grouped at three levels: the capability class; the subclass; and the unit, which is called management group in this survey. These levels are discussed in the following paragraphs.

Capability Classes, the broadest groups, are designated by Roman numerals I to VIII. The numerals indicate progressively greater limitations and narrower choices for practical use.

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife (no class V soils are in Kendall County).

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Class VII soils have very severe limitations that make them unsuited to cultivation and restrict their use largely to pasture or range, woodland, or wildlife.

Class VIII soils and landforms have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife, water supply, or esthetic purposes (no class VIII soils are in Kendall County).

Capability Subclasses are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral; for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in some parts of the United States but not in Kendall County, shows that the chief limitation is climate that is too cold or too dry.

Class I contains no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, although they have other limitations that restrict their use largely to pasture, range, woodland, wildlife, or recreation.

Management Groups, or capability units, are soil groups within the subclasses. The soils in one management group are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the management group is a convenient grouping for making many statements about management of soils. Management groups are generally designated by adding an Arabic numeral to the subclass symbol; for example, IIw-1 or IIIe-1. Thus, in one symbol the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the management group within each subclass.

The capability classification of the soils in Kendall County is given by management groups in the Guide to Mapping Units at the back of this survey.

Management groups

In the following pages the management groups in Kendall County are described, and suggestions are given for the use and management of all the soils of each group. The names of soil series represented are mentioned in the description of each management group, but this does not mean that all soils of a given series appear in the group. To find the names of all the soils in any given management group, refer to the Guide to Mapping Units at the back of this survey.

Soils used for cultivated crops generally need lime and fertilizer. The amounts to apply on a given soil should be determined by soil tests.

MANAGEMENT GROUP I-1

This group consists of deep, moderately well drained and well drained, nearly level soils of the Barrington, Batavia,

Dodge, DuPage, Plano, Plattville, Proctor, Rush, St. Charles, Saybrook, and Waupecan series. These soils generally have a surface layer of silt loam or loam and a subsoil of silty clay loam and clay loam. DuPage soils are loam and sandy loam below the surface layer.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high in the DuPage and Plano soils and moderate to low in the other soils.

These soils are well suited to corn, soybeans, small grains, and meadow. They are seldom used for pasture or woodland. Row crops can be grown intensively. Such practices as conservation tillage reduce soil compaction and help control soil blowing.

MANAGEMENT GROUP I-2

This group consists of deep, somewhat poorly drained, nearly level soils of the Brenton, Elburn, Kendall, Lisbon, Millbrook, Mundelein, and Virgil series. These soils have a surface layer of silt loam and a subsoil of silty clay loam and clay loam.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low in the Kendall soils and high to moderate in the other soils.

Additional drainage is needed in some areas. Maintaining tilth, fertility, and the organic-matter content is a necessary part of good management.

These soils are well suited to corn, soybeans, small grains, and meadow. They are seldom used for pasture or woodland. Row crops can be grown intensively. Such practices as conservation tillage reduce soil compaction and help control soil blowing.

MANAGEMENT GROUP IIe-1

This group consists of deep, moderately well drained and well drained, gently sloping to moderately sloping soils of the Barrington, Batavia, Camden, Dodge, La Rose, Plano, Plattville, Proctor, Rush, St. Charles, Saybrook, Strawn and Waupecan series. These soils have a surface layer of silt loam and a subsoil of silty clay loam and clay loam. Some of the soils are eroded.

Permeability is moderate, and the available water capacity is high. The organic-matter content is high in the Plano soils and moderate to low in the other soils.

Controlling erosion is the main concern of management. Erosion can be easily controlled by rotating row crops with small grains and meadow. The return of all crop residue helps maintain the organic-matter content and provide good tilth. If such conservation practices as terracing, contouring, and conservation tillage are used, more row crops can be grown in the cropping system. Grassed waterways remove excess water safely.

These soils are used mainly for corn and soybeans. They are also well suited to small grains and meadow. If the soils are used for pasture, adapted legumes and grasses should be favored when pasture is reseeded.

MANAGEMENT GROUP IIe-2

This group consists of deep, gently sloping, somewhat poorly drained soils of the Martinton and Swygert series and of moderately well drained soils of the Varna series. These soils have a surface layer of silt loam or silty clay loam and a subsoil of silty clay and heavy silty clay loam.

Permeability is moderately slow to slow, and the available water capacity is high. The organic-matter content is high to moderate.

The major concerns of management are controlling erosion, maintaining good tilth and organic-matter content, and providing drainage in some areas. All crop residue should be returned to the soil to help maintain the organic-matter content and provide good tilth. Grassed waterways remove excess water safely. Some small areas need additional drainage. Conservation tillage is an aid to good management of these soils.

These soils are well suited to corn, soybeans, small grains, and meadow. If they are well managed, they can be used intensively for cultivated crops and meadow.

MANAGEMENT GROUP IIw-1

This group consists of deep, poorly drained and very poorly drained, nearly level soils of the Drummer, Harpster, Knight, Milford, and Thorp series. These soils have a surface layer of silty clay loam or silt loam and a subsoil of silty clay loam and silty clay.

Permeability is moderate to slow, and the available water capacity is high to very high. The organic-matter content is moderate in the Thorp soil and high in the other soils. Harpster soils are calcareous throughout the profile.

Providing adequate drainage is the main concern of management. Tile drains are effective where adequate outlets are available. Tile lines should be spaced more closely in the Milford and Thorp soils, because they have slower permeability. Open ditches provide outlets for the tile lines. Good management and minimum tillage are needed to maintain tilth and organic-matter content. All crop residue should be returned to the soil. These soils are difficult to work if they are plowed when wet. Large acreages are plowed in fall and left bare during winter to balance the workload. Also, this allows freezing and thawing to break up large clods and compacted soil. Conservation tillage, growing winter cover crops, and leaving narrow strips unplowed over winter are some practices that help control soil blowing.

These soils are well suited to corn, soybeans, small grains, and meadow. They are seldom used for pasture or woodland. Row crops can be grown intensively.

MANAGEMENT GROUP IIw-2

This group consists of deep, poorly drained to somewhat poorly drained, level, bottom-land soils of the Millington and Sawmill series. These soils have a surface layer of silt loam or silty clay loam and a subsoil of silty clay loam to loam.

Permeability is moderate to moderately slow, and the available water capacity is high to very high. The organic-matter content is also high. Millington soils are calcareous throughout the profile.

Providing flood protection, good drainage, and good tilth is the major concern of management. These soils are subject to occasional to frequent flooding, usually in spring and early in summer. Tile provides adequate subsurface drainage where outlets are available. Conservation tillage reduces the need for field operations during wet periods.

Corn and soybeans are grown almost exclusively because of the hazard of flooding. In areas that are too narrow or too small to farm, pasture and woodland are suitable uses.

MANAGEMENT GROUP IIw-3

This group consists of deep, nearly level to depressional, poorly drained to very poorly drained soils of the Bryce and Peotone series. These soils have a surface layer of silty clay or silty clay loam and a subsoil of silty clay.

Permeability is moderately slow to slow, and the available water capacity is high to very high.

Providing adequate drainage and maintaining good tilth are the major concerns of management. Because the Peotone soils are in depressions that receive runoff from surrounding soils and the Bryce soils have slow permeability, tile drainage is of limited value. In areas of Peotone soils, tile outlets are difficult to locate, and surface inlets must be maintained. In areas of Bryce soils, tiles are most effective if used with surface inlets where water tends to pond. In most areas a combination of shallow surface drains and random tile lines is most effective. Open ditches are used to collect the water from the surface drains and the tile lines.

Good management and minimum tillage help to maintain tilth and the organic-matter content. All crop residue should be returned to the soil. These soils are difficult to work if they are plowed when wet. Large acreages are plowed in fall and left bare during winter to balance the workload. Also, this allows freezing and thawing to break up large clods and compacted soil. Where soil blowing occurs, strips should be left unplowed or winter cover crops should be used. An alternative conservation measure is to chisel in fall.

These soils are suited to corn, soybeans, small grains, and meadow. They are seldom used for pasture or woodland. Row crops can be grown intensively.

MANAGEMENT GROUP IIw-4

This group consists of deep, nearly level, somewhat poorly drained soils of the Del Rey, Martinton, Nappanee, and Swygert series. These soils have a surface layer of silt loam or silty clay loam and a subsoil of silty clay.

Permeability is moderately slow to very slow, and the available water capacity is high. The organic-matter content is high in the Martinton soils, moderate in the Swygert soils, and low in the Del Rey and Nappanee soils.

Providing drainage and maintaining good tilth and the organic-matter content are the major concerns of management. Some artificial drainage is needed in many areas. Shallow surface drains along with random tile lines are most effective. A cropping system that includes conservation tillage helps provide enough crop residue to maintain tilth and the organic-matter content.

These soils are well suited to corn, soybeans, small grains, and meadow. If they are well managed, they can be farmed intensively. Del Rey and Nappanee soils in many places are used for pasture and woodland.

MANAGEMENT GROUP IIs-1

This group consists of well-drained, nearly level to gently sloping soils of the Dresden, Fox, and Ripon series. These soils have a surface layer of silt loam and a subsoil of silty clay loam and clay loam. The root zone is restricted at a depth of 2 to 3 feet. Dresden and Fox soils are moderately deep over sand and gravel, and the Ripon soils are moderately deep over limestone bedrock.

Permeability is moderately rapid to moderate, and the available water capacity is moderate to low. The organic-matter content is moderate to low.

A cropping system that includes small grains and meadow is needed on these soils to increase the organic-matter content and the available water capacity. Because of the moderately rapid permeability and the shallow root zone, frequent but moderate applications of fertilizer are more effective than occasional large applications.

These soils are well suited to small grains. Their suitability for other crops is limited by the moderate to low available water capacity. Corn and soybeans are the main crops, but large acreages are in small grains, meadow, and pasture. If the soils are used for pasture, adapted legumes and grasses should be favored in reseeding.

MANAGEMENT GROUP IIIe-1

This group consists of deep, well-drained, moderately sloping to strongly sloping soils of the Camden, La Rose, and Strawn series. These soils are eroded to severely eroded. They have a surface layer of silt loam and a subsoil of silty clay loam and clay loam.

Permeability is moderate, and the available water capacity is high. The organic-matter content is low to moderate.

Controlling erosion is the main concern of management. Maintaining the organic-matter content is also necessary. Where erosion is severe, maintaining good tilth is a serious concern. Such conservation practices as contouring, terracing, and conservation tillage are needed to reduce erosion and keep soil losses at a low level. A crop rotation that includes grasses and legumes helps maintain tilth and the organic-matter content. Grassed waterways are needed to remove excess water safely.

These soils are suited to corn and soybeans. If they are used for pasture, adapted legumes and grasses should be favored in reseeding.

MANAGEMENT GROUP IIIe-2

This group consists of deep, somewhat poorly drained and moderately well drained, gently sloping to moderately sloping soils of the Nappanee, Swygert, and Varna series. These soils have a surface layer of silt loam or silty clay loam and a subsoil of silty clay.

Permeability is moderately slow to very slow, and the available water capacity is moderate to high. The organic-matter content is low to moderate.

Controlling erosion is the major concern of management. Other management concerns are maintaining tilth and the organic-matter content and controlling wetness in spring. Such practices as terracing and contouring are practical methods of controlling erosion on the Varna soils. The areas of Nappanee and Swygert soils are small, and erosion is better controlled on them by using conservation tillage and a cropping system that includes small grains and meadow. All crop residue should be returned to the soil to maintain the organic-matter content and provide good tilth. Grassed waterways remove excess water safely.

If these soils are used continuously for cultivated crops, conservation practices are needed. If the soils are used for pasture, adapted legumes and grasses should be favored when the pasture is reseeded. Existing stands of timber should not be cleared.

MANAGEMENT GROUP IIIw-1

This group consists of deep, very poorly drained, nearly level and depressional, organic soils of the Houghton and Lena series. These soils in many places receive water from surrounding areas and are subject to ponding.

Permeability is moderately rapid to variable, and the available water capacity is very high. These soils have somewhat low natural fertility. The Lena soils are calcareous throughout their profile.

Providing adequate drainage is the major concern of management. Other management concerns are proper fertili-

zation and controlling the ground water level during the growing season.

If drained, these soils are well suited to corn, soybeans, and many vegetable crops. They are seldom used for small grains and meadow. Some areas that are too wet for row crops are used for pasture. Overdrainage can result in soil blowing or fire.

MANAGEMENT GROUP IIIs-1

This group consists of moderately well drained to excessively drained, nearly level to moderately sloping soils of the Fox, Landes, Lorenzo, Ripon, and Sparta series. These soils have a surface layer of silt loam to loamy fine sand and underlying material of sand and gravel or limestone rock.

Permeability is moderate in the Ripon soils, moderately rapid in the Fox soils, rapid in the Landes and Lorenzo soils, and very rapid in the Sparta soils. The available water capacity is moderate in the Fox soils and low in the other soils. Organic-matter content is low to moderate.

The major concerns of management are water erosion on the Fox, Lorenzo, and Ripon soils; soil blowing on the Sparta soils; and flooding on the Landes soils. Cover crops or standing crop residue are needed to control erosion during winter.

These soils are suited to small grains. Their suitability for other crops is limited by the low to moderate available water capacity. If the soils are used for pasture, adapted legumes should be favored when pasture is reseeded. Existing woodlands should not be cleared.

MANAGEMENT GROUP IVe-1

This group consists of well drained and moderately well drained, strongly sloping soils of the La Rose, Lorenzo, Strawn, and Varna series. The La Rose, Strawn, and Varna soils are severely eroded. The Lorenzo soils have a surface layer of loam and underlying material of sand and gravel. The La Rose, Strawn, and Varna soils have a surface layer of silt loam. The La Rose and Strawn soils have a subsoil of silty clay loam and clay loam, and the Varna soils have a subsoil of silty clay.

Permeability is moderate in the La Rose and Strawn soils, moderately slow in the Varna soils, and rapid in the Lorenzo soils. The organic-matter content is moderate to low.

Controlling erosion and maintaining good tilth are the main concerns of management. Maintaining the organic-matter content is necessary to increase the available water capacity. Terraces, contour strips, and grassed waterways are needed to control erosion if row crops are grown. Minimum tillage or no tillage is important for controlling erosion in fields of row crops and small grains. Grazing should be regulated on established pasture. Wooded areas, which are almost exclusively on the Lorenzo soils, should be protected from fire and grazing animals.

These soils can be used only to a limited extent for row crops. They are well suited to meadow, pasture, and woodland.

MANAGEMENT GROUP VI

This group consists of deep, well-drained, moderately steep to very steep soils of the Hennepin and Strawn series. These soils have a surface layer of silt loam to loam and a subsoil of silt loam or loam to silty clay loam.

Permeability is moderate, and the available water capacity is moderate to high. The organic-matter content is low.

Controlling erosion is the major concern of management. Providing a good protective cover of pasture grasses or trees is also a concern. If old pastures are reseeded, they should be tilled on the contour to cut down erosion damage. Woodland should be maintained and protected from fire and grazing animals.

These soils are suited to permanent pasture and woodland. Areas now under cultivation should be converted to pasture or woodland.

MANAGEMENT GROUP VII

This group consists of well-drained, moderately steep to very steep soils of the Hennepin and Lorenzo series. The Hennepin soils have a surface layer of loam and a subsoil of silt loam to gravelly loam. The Lorenzo soils have a surface layer of loam and an underlying layer of sand and gravel.

Permeability is moderate in the Hennepin soil and rapid in the Lorenzo soil. The available water capacity and the organic-matter content are low to moderate.

Erosion on areas not protected by vegetation is a major concern of management. If old pastures are reseeded, they should be tilled on the contour to cut down erosion damage. Woodland should be maintained and protected from grazing animals.

These soils are better suited to woodland or pasture than to other uses.

Predicted Yields

Table 4 shows predicted yields of the principal crops grown in Kendall County under a high level of management. These predictions are based on yields for the period 1954–63, on soil tests, and on the experience and records of farmers, agronomists, conservationists, and farm advisors (*8*). The predictions are adjusted to reflect the trend toward higher yields during the period 1963–68. Average yields are expected to increase. A few farmers obtain yields as high as 200 bushels of corn per acre in some years, but yields this high are still uncommon.

Management was determined on the basis of farming techniques, crop varieties, and fertilizers commonly used in 1968. Differences in weather from year to year may cause annual yields to range 20 percent above or below those shown in the table. Hay and pasture yields are predicted for varieties of grasses and legumes that are suited to the soil.

Under high-level management, adequate drainage, flood control, and erosion control are provided; the proper number of plants is grown; high-quality seed is used; tillage is kept to a minimum and is done when soil moisture is favorable; weeds, plant diseases, and harmful insects are controlled; favorable soil reaction and near-optimum levels of nitrogen, phosphorus, and potassium are maintained; efficient use of available crop residue, barnyard manure, and green-manure crops is made; crops are harvested with the smallest possible loss; the combination of practices used is efficient; and all operations are timely.

Woodland

When the first settlers arrived in Kendall County, 34,000 acres or approximately 17 percent, was forested. Stands of oak, hickory, maple, cedar, and other hardwood trees were excellent. There followed many years of timber clearing for farming and many years of grazing, poor cutting practices,

TABLE 4.—*Predicted average acre yields of principal crops*

[Yields are those to be expected under a high level of management. Absence of a yield figure indicates that the soil is not well suited to the crop or that the crop is not commonly grown]

Soil[1]	Corn	Soybeans	Wheat	Alfalfa–grass	Rotation pasture
	Bushels	*Bushels*	*Bushels*	*Tons*	*AUD*[2]
Barrington silt loam, 0 to 2 percent slopes	115	40	50	5.0	250
Barrington silt loam, 2 to 4 percent slopes	112	40	50	5.0	250
Barrington silt loam, 4 to 7 percent slopes, eroded	105	35	45	4.0	200
Batavia silt loam, 0 to 2 percent slopes	120	42	52	5.2	260
Batavia silt loam, 2 to 4 percent slopes	115	40	52	5.2	260
Brenton silt loam	140	48	58	5.9	290
Brenton silt loam, bedrock substratum	140	48	58	5.9	290
Bryce silty clay	105	38	45	4.5	225
Camden silt loam, 1 to 4 percent slopes	108	38	48	5.0	250
Camden silt loam, 4 to 7 percent slopes, eroded	100	35	42	4.5	225
Camden silt loam, 7 to 12 percent slopes, eroded	95	32	40	4.2	210
Del Rey silt loam	105	35	45	4.5	225
Dodge silt loam, 0 to 2 percent slopes	105	38	48	4.8	240
Dodge silt loam, 2 to 4 percent slopes	102	38	48	4.8	240
Dodge silt loam, 4 to 7 percent slopes, eroded	95	35	42	4.2	210
Dresden silt loam, 0 to 2 percent slopes	90	32	42	3.8	190
Dresden silt loam, 2 to 4 percent slopes	90	32	42	3.8	190
Drummer silty clay loam	130	45	55	3.4	170
DuPage loam	115	40	48	4.5	225
Elburn silt loam	140	48	58	5.8	290
Fox silt loam, 1 to 4 percent slopes	85	28	38	3.5	175
Fox silt loam, 4 to 7 percent slopes, eroded	75	25	35	3.2	160
Harpster silty clay loam	120	42	50	4.5	225
Hennepin silt loam, 15 to 30 percent slopes				2.5	125
Hennepin silt loam, 30 to 45 percent slopes					
Houghton muck	110	38			
Kendall silt loam	115	40	50	5.0	250
Knight silt loam	103	38	43	4.0	200
Landes fine sandy loam	70	28	32	3.0	150
La Rose silt loam, 2 to 4 percent slopes, eroded	105	35	45	4.8	240
La Rose silt loam, 4 to 7 percent slopes, eroded	95	35	42	4.5	225
La Rose soils, 4 to 7 percent slopes, severely eroded	85	30	38	4.0	200
La Rose soils, 7 to 12 percent slopes, severely eroded	75	28	35	4.0	200
Lena muck	109	37			
Lisbon silt loam	130	45	55	5.5	275
Lorenzo loam, 4 to 7 percent slopes	65	25	32	2.5	125
Lorenzo loam, 7 to 18 percent slopes, eroded	60	22	30	2.5	125
Lorenzo loam, 18 to 40 percent slopes					70
Martinton silt loam, 0 to 2 percent slopes	115	40	50	5.0	250
Martinton silt loam, 2 to 4 percent slopes	103	37	42	4.0	200
Milford silty clay loam	115	40	48	4.8	240
Milford silty clay loam, bedrock substratum	115	40	48	4.8	240
Millbrook silt loam	125	45	55	5.2	260
Millington silt loam	115	40	45	4.2	210
Mundelein silt loam	115	40	50	5.0	250
Nappanee silt loam, 0 to 2 percent slopes	75	28	35	3.0	150
Nappanee silt loam, 2 to 4 percent slopes	75	28	35	3.0	150
Peotone silty clay loam	105	38	40	3.5	175
Plano silt loam, 0 to 2 percent slopes	135	48	55	5.5	275
Plano silt loam, 2 to 4 percent slopes	132	46	55	5.5	275
Plano silt loam, 4 to 7 percent slopes, eroded	115	40	50	4.8	240
Plattville silt loam, 0 to 2 percent slopes	110	40	48	4.0	200
Plattville silt loam, 2 to 4 percent slopes	105	37	46	4.0	200
Proctor silt loam, 0 to 2 percent slopes	125	45	55	5.2	260
Proctor silt loam, 2 to 4 percent slopes	123	45	55	5.2	260
Proctor silt loam, 4 to 7 percent slopes, eroded	115	40	50	4.8	240
Ripon silt loam, 1 to 4 percent slopes	92	35	40	4.0	200
Ripon silt loam, 4 to 7 percent slopes, eroded	85	25	28	3.5	175
Rush silt loam, 0 to 2 percent slopes	115	40	50	5.0	250
Rush silt loam, 2 to 4 percent slopes	112	40	50	5.0	250
St. Charles silt loam, 0 to 2 percent slopes	115	40	50	4.8	240
St. Charles silt loam, 2 to 4 percent slopes	112	40	50	4.8	240
St. Charles silt loam, 4 to 7 percent slopes, eroded	100	35	42	4.5	225
Sawmill silty clay loam	120	42	50	4.8	240
Saybrook silt loam, 0 to 2 percent slopes	120	42	50	5.2	260
Saybrook silt loam, 2 to 4 percent slopes	118	42	50	5.2	260
Saybrook silt loam, 2 to 4 percent slopes, eroded	115	40	50	5.0	250
Saybrook silt loam, 4 to 7 percent slopes, eroded	110	38	48	4.8	240
Sparta loamy fine sand, 3 to 10 percent slopes	60	20	32	2.5	125

TABLE 4.—*Predicted average acre yields of principal crops*—Continued

Soil[1]	Corn	Soybeans	Wheat	Alfalfa–grass	Rotation pasture
	Bushels	*Bushels*	*Bushels*	*Tons*	*AUD*[2]
Strawn silt loam, 4 to 7 percent slopes	85	30	42	4.0	200
Strawn silt loam, 4 to 7 percent slopes, eroded	80	28	38	3.5	175
Strawn silt loam, 7 to 15 percent slopes, eroded	75	28	35	3.2	160
Strawn silt loam, 15 to 30 percent slopes					125
Strawn soils, 4 to 7 percent slopes, severely eroded	75	28	35	3.2	160
Strawn soils, 7 to 12 percent slopes, severely eroded	70		35	3.0	150
Swygert silty clay loam, 0 to 2 percent slopes	100	35	45	4.5	225
Swygert silty clay loam, 2 to 4 percent slopes	95	32	42	4.2	210
Swygert silty clay loam, 3 to 7 percent slopes, eroded	85	30	38	4.0	200
Thorp silt loam	96	35	42	4.2	210
Varna silt loam, 1 to 4 percent slopes	100	38	48	5.0	250
Varna silt loam, 4 to 7 percent slopes, eroded	88	34	42	4.8	240
Varna soils, 7 to 15 percent slopes, severely eroded	65	20	35	3.5	175
Virgil silt loam	125	45	55	5.2	260
Waupecan silt loam, 0 to 2 percent slopes	130	45	50	4.5	225
Waupecan silt loam, 2 to 4 percent slopes	127	43	50	4.5	225

[1] Cut and fill land and Gravel pits are not listed because they are generally not used for cultivated crops.

[2] AUD is animal-unit-days, a term used to express the carrying capacity of pasture. It is the number of days 1 acre can carry 1 animal unit during a single grazing season without injury to the sod. One animal unit is defined as 1 cow, 2 yearling calves, 1 horse, 5 sheep, or 4 brood sows. For example, 20 sheep can graze about 25 days in a pasture that has a capacity of 100 animal-unit-days.

and burning. In 1967, according to a land-use study (*10*), only 4,500 acres, or less than 3 percent, of the woodland remained. Since that time the demand for wooded homesites has further reduced the acreage.

At present the woodland consists of understocked stands or poor-quality trees. A large part of it is on the steeper Strawn, Hennepin, and Lorenzo soils and on inadequately drained soils along the river and streams.

Many acres of steep, severely eroded soils in Kendall County should be reforested. Well-managed woodland not only produces wood products, but also protects watersheds, provides wildlife cover, and offers many recreational and educational opportunities.

The soils of Kendall County have been placed in six tree planting groups. In table 5 each group is briefly described, and the trees normally suitable for forest plantings, ornamental plantings, and windbreak plantings are shown. The names of the soil series represented are mentioned in the description of each group. The tree planting classification of each individual soil is given in the "Guide to Mapping Units." Cut and fill land and Gravel pits were not placed in the tree planting groups.

Soil for Recreational Development

Knowledge of soils is necessary in planning, developing, and maintaining areas used for recreation. In table 6 are shown the degree of limitation and the soil features that affect the use of soils in Kendall County for playgrounds; picnic areas; paths and trails; golf fairways; cottage, service, and utility buildings; and camp areas.

In table 6 the limitations for the specified uses are given as slight, moderate, or severe. For all degrees of limitation, it is assumed that a good cover of vegetation can be established and maintained. A limitation of *slight* means that soil properties are generally favorable and limitations are so minor that they can be easily overcome. *Moderate* means that the limitation can be overcome or modified by planning, design, or special maintenance. *Severe* means that costly soil reclamation, special design, intense maintenance, or a combination of these is required.

Playgrounds are areas used intensively for baseball, football, badminton, and similar organized games. Soils suitable for this use need to withstand intensive foot traffic. The best soils have a nearly level surface free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry. If grading and leveling are required, depth to rock is important.

Picnic areas are attractive natural or landscaped tracts that are used mainly for preparing meals and eating outdoors. These areas are subject to heavy foot traffic. Most of the vehicular traffic, however, is confined to access roads. The best soils are firm when wet but not dusty when dry, are free of flooding during the season of use, and do not have slopes or stoniness that greatly increase the cost of leveling sites or of building access roads.

Paths and trails are used for local and cross-country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded no more than once during the season of use, have slopes of less than 15 percent, and have few or no rocks or stones on the surface.

Golf fairways include soils that are rated according to their limitations for fairways only. Greens, traps, and hazards generally are made from transported soil material. Soils used for fairways should support intensive traffic by people on foot or driving golf carts. Turf and various kinds of trees and shrubs grow well on these soils.

Cottage, service, and utility buildings include cottages, washrooms and bathrooms, picnic shelters, and service buildings that are used seasonally or all year. The ratings are based mainly on soil features that contribute to the adequate support of these structures. Information on soil limitations for septic tank absorption fields is given in the section "Engineering Uses of the Soils."

Camp areas are used intensively for tents and small camp trailers and the accompanying activities of outdoor living.

TABLE 5.—*Guide for forest, ornamental, and windbreak plantings*

Tree planting groups	Forest plantings	Ornamental plantings at maturity	Windbreak plantings
Group 1: Barrington, Batavia, Camden, Dodge, Dresden, Fox, Hennepin, La Rose, Lorenzo, Plano, Plattville, Proctor, Ripon, Rush, St. Charles, Saybrook, Sparta, Strawn, Varna, and Waupecan soils. Well drained to moderately well drained permeable soils.	In sheltered coves and on north and east slopes: white oak, red oak, European larch, eastern white pine, and red pine. On exposed ridges of south- and west-facing slopes and on open, level terrain: red pine, eastern white pine, and Norway spruce.	Less than 30 feet high: Amur maple, European mountain ash, flowering dogwood, Oriental arborvitae, and blackgum. 30 to 60 feet high: American hornbean, Colorado blue spruce, Norway maple, green ash, and white birch. More than 60 feet high: yellow-poplar, sweetgum, white fir, black cherry, sugar maple, and European beech.	Norway spruce, eastern red pine, white pine, white spruce, and eastern redcedar.
Group 2: Brenton, Elburn, Kendall, Lisbon, Millbrook, Mundelein, and Virgil soils. Somewhat poorly drained permeable soils.	Red oak, white oak, eastern white pine, red pine, eastern larch, Norway spruce, and Douglas-fir.	Less than 30 feet high: European mountain ash, striped maple, mountain maple, Amur maple, flowering dogwood, and redbud. 30 to 60 feet high: American hornbean, Norway maple, green ash, and American yellowwood. More than 60 feet high: sugar maple, European beech, pin oak, white oak, Chinese chestnut, white ash, and sweetgum.	Eastern redcedar, Lombardy poplar, red pine, white spruce, and Russian-olive.
Group 3: Del Rey, Martinton, Nappanee, and Swygert soils. Somewhat poorly drained soils that have moderately slow and slow permeability.	Sycamore, green ash, red maple, Norway spruce. Protect trees already established.	Less than 30 feet high: northern white-cedar and crabapple. 30 to 60 feet high: Norway maple, weeping willow, black spruce, moraine locust, aspen, and eastern redcedar. More than 60 feet high: red maple, white poplar, honeylocust (thornless), sweetgum, and European alder.	Eastern redcedar, Lombardy poplar, northern white-cedar, quaking aspen, and Russian-olive.
Group 4: Bryce, Drummer, Harpster, and Milford soils. Poorly drained soils that are artificially drained and soils that have slow to moderate permeability.	Black walnut, red oak, white oak, cottonwood, sycamore, and green ash.	Less than 30 feet high: flowering dogwood, crabapple, and forsythia. 30 to 60 feet high: weeping willow and gray birch. More than 60 feet high: white poplar, red oak, white oak, red maple, European larch, and white birch.	Northern white-cedar, Lombardy poplar, speckled alder, Russian-olive, Amur maple, and autumn-olive.
Group 5: DuPage, Knight, Landes, Millington, Peotone, Sawmill, and Thorp soils. Bottom-land and very poorly drained soils that have rapid to slow permeability and are subject to ponding and flooding.	Leave in natural state or add to plantings already established.	Leave in natural state or add to plantings already established.	Black willow, eastern cottonwood, northern white-cedar, and eastern larch.
Group 6: Houghton and Lena soils. Organic soils.	Leave in natural state for wildlife cover. Planting is difficult, and survival of most plantings is poor.	Leave in natural state for wildlife cover. Planting is difficult, and survival of most plantings is poor.	Black willow, eastern cottonwood, eastern larch, and black spruce.

Little preparation of the site is required other than shaping and leveling for tent and parking areas. Camp areas are subject to heavy foot traffic and limited vehicular traffic. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface that is firm after rain but not dusty when dry.

Wildlife[3]

Wildlife in Kendall County can be placed in three major groups: openland, woodland, and wetland. The soils in the county have potential for habitat development for all three kinds of wildlife.

[3] By REX HAMILTON, biologist, Soil Conservation Service.

In table 7 the soils are placed in six groups and rated according to their suitability for elements of wildlife habitat and for kinds of wildlife. The ratings are good, fair, poor, and very poor. A rating of *good* means that habitat is easily established, improved, or maintained. *Fair* indicates that the soils have moderate limitations for establishing and maintaining habitat. *Poor* means that the soils have severe limitations for establishing and maintaining habitat and that management may be difficult and expensive. A rating of *very poor* means that it is generally impractical to establish and maintain wildlife habitat on these soils.

The six elements of wildlife habitat and the three kinds of wildlife shown in table 7 are defined in the following paragraphs.

Grain and seed crops are domestic grains or seed-producing annual plants, among which are such crops as corn, sorghum, wheat, oats, soybeans, buckwheat, and sunflower.

Grasses and legumes are domestic perennial grasses and legumes. Among these are such crops as brome, fescue, timothy, redtop, orchardgrass, reed canarygrass, clover, trefoil, alfalfa, and sericea lespedeza.

Wild herbaceous upland plants are native or introduced perennial grasses and forbs that provide food and cover principally for upland wildlife. Among these plants are bluestem, indiangrass, wheatgrass, wildrye, oatgrass, pokeweed, strawberries, lespedeza, tickclover, wild beans, jewelweed, and ragweed.

Hardwoods are nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, twigs (browse), or foliage used extensively as food by wildlife. Among these plants, which are commonly established by natural processes but which are also planted, are oak, cherry, hawthorn, dogwood, viburnum, hazel, maple, birch, ash, grapes, sumac, briers, greenbriers, and roses.

Wetland food and cover plants are annual and perennial wild herbaceous plants, excluding submerged or floating aquatic plants, that grow on moist or wet sites. Among these plants, used mainly by wetland wildlife for food and cover, are smartweed, wild millet, rushes, sedges, reeds, rice cutgrass, mannagrass, bluejoint, cordgrass, cattails, pondweeds, wild celery, and spatterdocks.

Shallow-water developments are impoundments or excavations generally no more than 5 feet deep. Examples are low dikes and levees, shallow dugouts, level ditches, and devices for controlling the water level on marshy streams or channels.

Soils are not rated for impounded farm ponds in table 7. However, this type of pond attracts migratory waterfowl and can be used for freshwater fish. Features that affect the use of soils for impounded farm ponds are shown in table 10.

Openland wildlife include quail, mourning dove, meadowlark, cottontail rabbit, red fox, pheasant, and other birds and mammals that normally live on cropland, pasture, hayland, and other areas overgrown by grasses, forbs, and shrubs. Elements of wildlife habitat used to rate the soils for this kind of wildlife are grain and seed crops, grasses and legumes, wild herbaceous upland plants, and hardwoods.

Woodland wildlife include squirrel, white-tailed deer, raccoon, chipmunks, woodpeckers, nuthatches, and other birds and mammals that frequent wooded areas consisting of hardwood trees and shrubs. Elements of wildlife habitat used to rate the soils for this kind of wildlife are grasses and legumes, wild herbaceous upland plants, and hardwoods.

Wetland wildlife include various kinds of waterfowl, muskrat, mink, kingfisher, red-winged blackbird, and other birds and mammals that normally live in such wet areas as ponds, marshes, and swamps. Elements of wildlife habitat used to rate the soils for this kind of wildlife are wetland food and cover plants and shallow water developments.

Engineering Uses of the Soils

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain-size distribution, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate the performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting the performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables. Table 8 shows results of engineering laboratory tests on soil samples; table 9 gives several estimated soil properties significant in engineering; and table 10 gives interpretations for various engineering uses.

This information, along with the general soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 9 and 10, and it also can be used to make other useful maps.

This information, however, does not eliminate the need for further investigations at sites selected for engineering works. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning in soil science that is not used in engineering. The Glossary defines many of these terms as they are commonly used in soil science.

Engineering soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system (*9*) used

TABLE 6.—*Interpretations*

Soil series and map symbols	Degree of limitation and soil features affecting use for—	
	Playgrounds	Picnic areas
Barrington: 443A, 443B, 443C2	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: grading may be necessary.	Slight
Batavia: 105A, 105B	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: grading may be necessary.	Slight
Brenton: 149, R149	Moderate: seasonal high water table	Moderate: seasonal high water table
Bryce: 235	Severe: slow permeability; seasonal high water table near surface; sticky when wet; subject to ponding; slow to dry.	Severe: slow permeability; seasonal high water table near surface; sticky when wet; subject to ponding; slow to dry.
Camden: 134B, 134C2, 134D2	Slight where slope is 1 to 2 percent. Moderate where slope is 2 to 7 percent. Severe where slope is 7 to 12 percent: grading may be necessary.	Slight where slope is 1 to 7 percent. Moderate where slope is 7 to 12 percent.
Del Rey: 192	Moderate: seasonal high water table; slow to dry.	Moderate: seasonal high water table; slow to dry.
Dodge: 24A, 24B, 24C2	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: grading may be necessary.	Slight
Dresden: 325A, 325B	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 4 percent: grading may be necessary.	Slight
Drummer: 152	Severe: seasonal high water table near surface; sticky when wet; slow to dry.	Severe: seasonal high water table near surface; sticky when wet; slow to dry.
DuPage: 321	Severe: subject to flooding; seasonal high water table.	Moderate to severe, depending upon frequency of flooding: subject to flooding; seasonal high water table.
Elburn: 198	Moderate: seasonal high water table	Moderate: seasonal high water table
Fox: 327B, 327C2	Moderate	Slight
Harpster: 67	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; slow to dry; subject to ponding.
Hennepin: 25F, 25G	Severe	Severe
Houghton: 103	Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.
Kendall: 242	Moderate: seasonal high water table	Moderate: seasonal high water table

for recreational development

Degree of limitation and soil features affecting use for—Continued			
Paths and trails	Golf fairways	Cottage, service, and utility buildings	Camp areas
Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight.
Moderate: seasonal high water table	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Severe: slow permeability; sticky when wet; subject to ponding; slow to dry.	Severe: slow permeability; seasonal high water table near surface; sticky when wet; turf difficult to maintain.	Severe: slow permeability; subject to ponding; seasonal high water table near surface; sticky when wet.	Severe: slow permeability; subject to ponding; seasonal high water table near surface.
Slight	Slight where slope is 1 to 7 percent, moderate where slope is 7 to 12 percent.	Slight where slope is 1 to 7 percent. Moderate where slope is 7 to 12 percent if septic tank is not used or where slope is 4 to 7 percent if septic tank is used.	Slight where slope is 1 to 7 percent, moderate where slope is 7 to 12 percent.
Moderate: seasonal high water table; slow to dry.	Moderate: seasonal high water table; slow to dry; turf difficult to maintain.	Moderate if septic tank is not used. Severe if septic tank is used: seasonal high water table; slow permeability.	Moderate: seasonal high water table; slow to dry.
Slight	Slight where slope is 0 to 4 percent, moderate where slope is 4 to 7 percent.	Slight where slope is 0 to 7 percent if septic tank is not used. Moderate where slope is 4 to 7 percent if septic tank is used.	Slight.
Slight	Slight	Slight	Slight.
Severe: seasonal high water table near surface; sticky and slippery when wet; slow to dry.	Severe: seasonal high water table near surface; sticky when wet; slow to dry; turf easily damaged when wet.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.
Moderate: use restricted to non-flooding periods; seasonal high water table.	Severe: subject to flooding and overflow; seasonal high water table.	Severe: subject to flooding; seasonal high water table.	Severe: subject to flooding; seasonal high water table.
Moderate: seasonal high water table	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Slight	Slight	Slight if septic tank is not used. Moderate if septic tank is used: possible ground water contamination if septic tank system is used.	Slight.
Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; sticky when wet; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.
Severe	Severe	Severe	Severe.
Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.
Moderate: seasonal high water table	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.

TABLE 6.—*Interpretations for*

Soil series and map symbols	Degree of limitation and soil features affecting use for—	
	Playgrounds	Picnic areas
Knight: 191	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding.
Landes: 304	Severe: subject to flooding; lacks firm surface.	Moderate to severe, depending upon frequency of flooding.
La Rose: 60B2, 60C2, 60C3, 60D3	Moderate where slope is 2 to 7 percent. Severe where slope is 7 to 12 percent.	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent.
Lena: 210	Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.
Lisbon: 59	Moderate: seasonal high water table	Moderate: seasonal high water table
Lorenzo: 318C, 318D2, 318F	Moderate where slope is 4 to 7 percent: droughty; grading likely to expose gravel. Severe where slope is 7 to 30 percent.	Slight where slope is 4 to 7 percent. Moderate where slope is 7 to 18 percent: droughty. Severe where slope is 18 to 30 percent.
Martinton: 189A, 189B	Moderate: seasonal high water table	Moderate: seasonal high water table
Milford: 69, R69	Severe: seasonal high water table near surface; sticky when wet; slow to dry.	Severe: seasonal high water table near surface; sticky when wet; slow to dry.
Millbrook: 219	Moderate: seasonal high water table	Moderate: seasonal high water table
Millington: 82	Severe: seasonal high water table near surface; subject to flooding.	Severe: seasonal high water table near surface; subject to flooding.
Mundelein: 442	Moderate: seasonal high water table	Moderate: seasonal high water table
Nappanee: 228A, 228B	Moderate: seasonal high water table; very slow permeability.	Moderate: seasonal high water table; very slow permeability.
Peotone: 330	Severe: seasonal high water table at or near surface; subject to ponding; sticky when wet.	Severe: seasonal high water table at or near surface; subject to ponding; sticky when wet.
Plano: 199A, 199B, 199C2	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: grading may be necessary.	Slight
Plattville: 240A, 240B	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 4 percent: some grading may be necessary.	Slight
Proctor: 148A, 148B, 148C2	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: some grading may be necessary.	Slight

recreational development—Continued

Degree of limitation and soil features affecting use for—Continued			
Paths and trails	Golf fairways	Cottage, service, and utility buildings	Camp areas
Severe: seasonal high water table near surface; subject to ponding.	Severe: seasonal high water table near surface; subject to ponding.	Severe: seasonal high water table near surface; subject to ponding.	Severe: seasonal high water table near surface; subject to ponding.
Moderate to severe, depending upon frequency of flooding.	Severe: subject to flooding; turf difficult to maintain.	Severe: subject to flooding	Severe: subject to flooding; turf difficult to maintain.
Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent.	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent: seeding hard to establish on eroded slopes.	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent. If septic tank is not used or where slope is 4 to 7 percent if septic tank is used.	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent: seeding hard to establish on eroded slopes.
Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained.	Severe: ponded most of the year if undrained; highly unstable if drained: slow to dry.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Slight where slope is 4 to 18 percent. Moderate where slope is 18 to 30 percent.	Moderate where slope is 4 to 18 percent: droughty. Severe where slope is 18 to 30 percent.	Moderate where slope is 4 to 18 percent: possible ground water contamination if septic tank is used. Severe where slope is 18 to 30 percent.	Moderate where slope is 4 to 18 percent. Severe where slope is 18 to 30 percent: turf difficult to maintain.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate if septic tank is not used: seasonal high water table. Severe if septic tank is used: slow permeability.	Moderate: seasonal high water table; moderately slow permeability.
Severe: seasonal high water table near surface; sticky when wet; slow to dry.	Severe: seasonal high water table near surface; sticky when wet; turf easily damaged when wet.	Severe: seasonal high water table near surface; sticky when wet; slow to dry; subject to post heave.	Severe: seasonal high water table near surface; sticky when wet; slow to dry.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Severe: seasonal high water table near surface.	Severe: seasonal high water table near surface; subject to flooding.	Severe: seasonal high water table near surface; subject to flooding.	Severe: seasonal high water table near surface; subject to flooding.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table; very slow permeability.	Moderate if septic tank is not used: seasonal high water table. Severe if septic tank is used: very slow permeability.	Moderate: seasonal high water table; very slow permeability.
Severe: seasonal high water table at or near surface; subject to ponding; sticky when wet.	Severe: seasonal high water table at or near surface; subject to ponding; turf easily damaged when wet.	Severe: seasonal high water table at or near surface; subject to ponding; subject to post heave.	Severe: seasonal high water table at or near surface; subject to ponding; sticky when wet.
Slight	Slight	Slight	Slight.
Slight	Slight	Slight if septic tank is not used. Moderate if septic tank is used: bedrock at a depth of 3 to 5 feet.	Slight.
Slight	Slight	Slight	Slight.

TABLE 6.—*Interpretations for*

Soil series and map symbols	Degree of limitation and soil features affecting use for—	
	Playgrounds	Picnic areas
Ripon: 324B, 324C2	Moderate where slope is 1 to 4 percent. Severe where slope is 4 to 7 percent: moderate depth to bedrock hinders construction.	Moderate where slope is 1 to 7 percent: moderate depth to bedrock hinders construction.
Rush: 791A, 791B	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 4 percent.	Slight
St. Charles: 243A, 243B, 243C2	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: some grading may be necessary.	Slight
Sawmill: 107	Severe: subject to flooding; seasonal high water table near surface; sticky when wet.	Severe: subject to flooding; seasonal high water table near surface; sticky when wet.
Saybrook: 145A, 145B, 145B2, 145C2	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 7 percent: some grading may be necessary.	Slight
Sparta: 88C	Severe: soil texture unfavorable	Moderate: sandy soil difficult to vegetate; subject to blowing; lacks firm surface.
Strawn: 224C, 224C2, 224C3, 224D2, 224D3, 224F	Moderate where slope is 4 to 7 percent. Severe where slope is 7 to 30 percent.	Slight where slope is 4 to 7 percent. Moderate where slope is 7 to 15 percent. Severe where slope is 15 to 30 percent.
Swygert: 91A, 91B, 91C2	Moderate: seasonal high water table; slow permeability; sticky when wet.	Moderate: seasonal high water table; slow permeability; sticky when wet.
Thorp: 206	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.
Varna: 223B, 223C2, 223D3	Moderate where slope is 2 to 7 percent. Severe where slope is 7 to 12 percent.	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent: slopes erodible.
Virgil: 104	Moderate: seasonal high water table	Moderate: seasonal high water table
Waupecan: 369A, 369B	Slight where slope is 0 to 2 percent. Moderate where slope is 2 to 4 percent.	Slight

recreational development—Continued

Degree of limitation and soil features affecting use for—Continued			
Paths and trails	Golf fairways	Cottage, service, and utility buildings	Camp areas
Slight	Moderate where slope is 1 to 4 percent. Severe where slope is 4 to 7 percent: turf difficult to maintain in sloping areas.	Moderate if septic tank is not used. Severe if septic tank is used: moderate depth to bedrock hinders construction.	Slight where slope is 1 to 4 percent. Moderate where slope is 4 to 7 percent: moderate depth to bedrock.
Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight.
Severe: subject to flooding; seasonal high water table near surface; sticky when wet.	Severe: subject to flooding; seasonal high water table near surface; turf easily damaged when wet.	Severe: subject to flooding; seasonal high water table near surface.	Severe: subject to flooding; seasonal high water table near surface; sticky when wet.
Slight	Slight	Slight; moderate where slope is 4 to 7 percent if septic tank is used.	Slight.
Moderate: sandy soil difficult to vegetate; lacks firm surface.	Severe: texture unfavorable for establishment of turf; low fertility; droughty.	Moderate: sandy soil difficult to vegetate; subject to blowing; rapid permeability; droughty.	Moderate: sandy soil difficult to vegetate; subject to blowing; lacks firm surface.
Slight where slope is 4 to 7 percent. Moderate where slope is 7 to 15 percent. Severe where slope is 15 to 30 percent.	Slight where slope of 4 to 7 percent is uneroded or moderately eroded. Moderate where slope of 4 to 7 percent is severely eroded and where slope of 7 to 15 percent is moderately eroded. Severe where slope of 7 to 15 percent is eroded and where slope is more than 15 percent.	Slight where slope is 4 to 7 percent if septic tank is not used. Moderate where slope is 4 to 7 percent if septic tank is used and where slope is 7 to 15 percent. Severe where slope is 15 to 30 percent.	Slight where slope is 4 to 7 percent. Moderate where slope is 7 to 15 percent. Severe where slope is 15 to 30 percent: eroded slopes difficult to vegetate.
Moderate: seasonal high water table; slippery and sticky when wet.	Moderate: seasonal high water table; sticky when wet; slow to dry.	Moderate if septic tank is not used: seasonal high water table; slow permeability. Severe if septic tank is used.	Moderate: seasonal high water table; slow permeability; sticky when wet.
Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.	Severe: seasonal high water table near surface; subject to ponding; slow to dry.
Slight	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent: eroded slopes difficult to vegetate.	Slight where slope is 2 to 7 percent. Moderate where slope is 7 to 12 percent if septic tank is not used, and severe if septic tank is used: slow permeability.	Moderate where slope is 2 to 7 percent. Severe where slope is 7 to 12 percent: eroded slopes difficult to vegetate.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Slight	Slight	Slight	Slight.

TABLE 7.—*Suitability for elements of*

[Mapping units in each wildlife group are listed in numerical order as they

Wildlife groups	Elements of wildlife habitat		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants
Group 1: 24A, 24B, 60B2, 105A, 105B, 134B, 145A, 145B, 145B2, 148A, 148B, 199A, 199B, 223B, 240A, 240B, 243A, 243B, 324B, 325A, 325B, 327B, 369A, 369B, 443A, 443B, 791A, 791B. Level to gently sloping, well-drained soils that have moderate to moderately rapid permeability; on uplands.	Good	Good	Good
Group 2: 59, 91A, 91B, 104, 149, R149, 189A, 189B, 192, 198, 219, 228A, 228B, 242, 442. Level and gently sloping, somewhat poorly drained soils that have moderate, moderately slow, and slow permeability; on uplands.	Good	Good	Good
Group 3: 67, 69, R69, 152, 235. Nearly level, poorly drained soils; on uplands.	Fair: wetness	Fair: wetness	Fair: wetness
Group 4: 82, 103, 107, 191, 206, 210, 304, 321, 330. Very poorly drained depressional soils and soils on bottom lands that are subject to flooding.	Poor: excessive wetness and flooding.	Poor: excessive wetness. Fair on better drained soils on bottom lands.	Poor: excessive wetness. Fair on better drained soils on bottom lands.
Group 5: 24C2, 60C2, 60C3, 88C, 91C2, 134C2, 134D2, 145C2, 148C2, 199C2, 223C2, 224C, 224C2, 224C3, 224D2, 243C2, 318C, 318D2, 324C2, 327C2, 443C2. Moderately sloping soils that are slightly to highly susceptible to erosion and strongly sloping soils that are slightly and moderately susceptible to erosion; on uplands.	Fair	Good	Good
Group 6: 25F, 25G, 60D3, 223D3, 224D3, 224F, 318F. Strongly sloping, severely eroded, moderately steep, steep, and very steep soils that are moderately susceptible to further erosion; on uplands.	Poor	Fair: erosion limits use.	Fair: erosion limits use.

by the Soil Conservation Service, Department of Defense, and other agencies, and the AASHO system (*1*) adopted by the American Association of State Highway Officials.

In the Unified system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic-matter content. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, GP-GM.

The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A-1, A-2, and A-7 groups are divided as follows: A-1-a, A-1-b; A-2-4, A-2-5, A-2-6, A-2-7; and A-7-5 and A-7-6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHO classification for tested soils, with group index numbers in parentheses, is shown in table 8; the estimated classification, without group index numbers, is given in table 9 for all soils mapped in Kendall County.

Soil test data

Table 8 shows engineering test data for some of the major soil series in Kendall County. These tests were made to help evaluate the soils for engineering purposes. The engineering classifications given are based on data obtained by mechanical analyses and by tests to determine liquid limits and plastic limits obtained in the laboratories of the Illinois Division of Highways, Bureau of Materials, at Springfield. The mechanical analyses were made by the combined sieve and hydrometer methods.

Table 8 also shows data on the relationship between the moisture content and the density of the soil when compacted. These data were determined by the standard methods described in AASHO Designation: T 99-57 (*1*). If the soil material is compacted at successively higher moisture content, assuming that the same amount of force is used in compacting the soil, the density of the compacted material increases until the *optimum moisture content* is reached. After that, the density decreases as the moisture content increases. The ovendry weight, in pounds per cubic foot, of the soil at the optimum moisture content is the *maximum dry density*. Data on the relationship of moisture to density are important in planning earthwork, because generally the soil is most stable if it is compacted to about its maximum dry density when it is at approximately the optimum moisture content.

wildlife habitat and kinds of wildlife
are in the "Guide to Mapping Units" at the back of this publication]

Elements of wildlife habitat—Continued			Kinds of wildlife		
Hardwoods	Wetland food and cover plants	Shallow-water developments	Openland	Woodland	Wetland
Good	Poor: too well drained.	Poor: too well drained.	Good	Good	Poor: too well drained.
Good	Fair: limited retention of water.	Fair: limited retention of water.	Good	Good	Fair: limited retention of water.
Fair: wetness	Good	Good	Fair: wetness	Fair: wetness	Good.
Poor: excessive wetness. Fair on better drained soils on bottom lands.	Good	Good	Poor: excessive wetness. Fair on better drained soils on bottom lands.	Poor: excessive wetness. Fair on better drained soils on bottom lands.	Good.
Good	Poor: too well drained.	Poor: too well drained.	Good	Good	Poor: too well drained.
Good	Poor: too well drained.	Poor: too well drained.	Fair: erosion limits use.	Good	Poor: too well drained.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic. If the moisture content is further increased, the material changes from a plastic to a liquid. The plastic limit is the moisture content at which the soil material changes from the semisolid to plastic; and the liquid limit, from a plastic to a liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Soil properties significant in engineering

Several estimated soil properties significant in engineering are shown in table 9. These estimates are made for typical soil profiles, by layers sufficiently different to have different significance for soil engineering. The estimates are based on field observations made in the course of mapping, on test data for these and similar soils, and on experience with the same kinds of soil in other counties.

Depth to bedrock is not estimated in table 9 because most soils in the survey area are deep enough that bedrock generally does not affect their use. The estimates generally are to depths of about 5 feet; therefore, the interpretations normally do not apply to greater depths. Soils that do not extend to a depth of 5 feet or more are Millford soil, bedrock substratum and Brenton soil, bedrock substratum that have limestone bedrock at a depth of 3 to 5 feet and Ripon soils that have limestone bedrock at a depth of 20 to 36 inches. Following are explanations of some of the columns in table 9.

Depth to seasonal high water table is the distance from the surface of the soil to the highest level that ground water reaches in the soil in most years.

Soil texture is described in table 9 in the standard terms used by the Department of Agriculture. These terms take into account the relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary of this soil survey.

Permeability is that quality of a soil that enables it to transmit water or air. It is estimated on the basis of those soil characteristics observed in the field, particularly structure and texture. The estimates in table 9 do not take into account lateral seepage or such transient soil features as plowpans and surface crusts.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Shrink-swell potential is the relative change in volume to be expected of soil material with changes in moisture content,

TABLE 8.—*Engineering*

[Tests made by Illinois Division of Highways,

Soil name and location	Parent material	Report no. 70–I11–047	Depth from surface	Moisture-density data[1]		Mechanical analysis[2]	
				Maximum dry density	Optimum moisture	Percentage passing sieve—	
						No. 4 (4.7 mm)	No. 10 (2.0 mm)
			Inches	*Pounds per cubic feet*	*Percent*		
Dodge silt loam:							
31 feet west and 1,240 feet south of NE. corner sec. 11, T. 36 N., R. 7 E. (Modal)	Loess over loam till.	1–1	0–10	102	19	100	100
		1–2	15–22	100	20	99	99
		1–3	33–50	127	11	91	86
Drummer silty clay:							
SE1/4SE1/4SW1/4SW1/4 sec. 21, T. 36 N., R. 8 E., 33 feet south of road center and 29 feet west of fence. (Modal)	Loess over loamy outwash.	3–1	0–9	89	22	100	100
		3–2	16–32	106	19	100	100
		3–3	38–55	126	11	87	84
Milford silty clay loam:							
NW1/4NE1/4NW1/4SW1/4 sec. 15, T. 35 N., R. 6 E., 98 feet south of highway center and 75 feet east of lane center. (Modal)	Silty clay loam lakebed sediments.	2–1	3–13	82	30	100	100
		2–2	18–32	104	19	100	100
		2–3	42–64	125	11	87	83
Peotone silty clay loam:							
NE1/4NE1/4NE1/4 sec. 13, T. 37 N., R. 8 E., 160 feet west of highway center and 75 feet south of road center. (Modal)	Silty and clayey material over loamy glacial drift.	5–1	3–14	92	24	100	100
		5–2	27–38	114	15	95	93
		5–3	52–68	108	17	97	95
Plano silt loam:							
SW1/4NW1/4NE1/4NW1/4 sec. 7, T. 37 N., R. 7 E., 80 feet east and 25 feet north of 40-acre corner. (Modal)	Loess over sandy loam till.	4–1	3–13	100	20	100	100
		4–2	20–35	109	17	100	100
		4–3	48–58	121	11	98	96
Waupecan silt loam:							
SE1/4NE1/4NE1/4 sec. 22, T. 37 N., R. 7 E., 210 feet northeast of fence and 95 feet southeast of road. (Modal)	Silty and loamy material over sand and gravel.	6–1	0–10	106	17	100	100
		6–2	25–34	103	20	99	98
		6–3	49–60	124	10	94	87

[1] Based on AASHO Designation: T 99–57 (*1*).

[2] Analysis according to AASHO Designation: T 88. Results by this procedure frequently differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS

that is, the extent to which the soil shrinks as it dries out or swells when it is wet. Extent of shrinking and swelling is influenced by the amount and kind of clay in the soil. Shrinking and swelling of soils causes much damage to building foundations, roads, and other structures. A high shrink-swell potential indicates a risk to maintenance of structures built in, on, or with material having this rating.

Engineering interpretations of soils

The estimated interpretations in table 10 are based on the engineering properties of soils shown in table 9, on test data for soils in this survey area and others nearby or adjoining, and on the experience of engineers and soil scientists with the soils of Kendall County. In table 10, ratings are used to summarize the limitation or suitability of the soils for all listed purposes other than for drainage of cropland; irrigation; pond reservoir areas; embankments, dikes, and levees; and terraces and diversions. For these particular uses, table 10 lists those soil features not to be overlooked in planning, installation, and maintenance.

Soil limitations are indicated by the ratings slight, moderate, and severe. *Slight* means soil properties generally are favorable for the specified use, or that the limitations are minor and easily overcome. *Moderate* means that some soil properties are unfavorable but can be overcome or modified by special planning and design. *Severe* means soil properties are so unfavorable and so difficult to correct or overcome that major soil reclamation and special design are required.

Soil suitability is rated by the terms *good, fair*, and *poor*, which have meanings approximately parallel to the terms slight, moderate, and severe, respectively.

Following are explanations of the column heads in table 10.

Septic tank absorption fields are subsurface systems of tile or perforated pipe that distribute effluent from a septic tank

test data

Bureau of Materials, Springfield]

Mechanical analysis[2]						Liquid limit	Plasticity index	Classification	
Percentage passing sieve—Continued		Percentage smaller than—						AASHO[3]	Unified[4]
No. 40 (0.42 mm)	No. 200 (0.074 mm)	0.05 mm	0.02 mm	0.005 mm	0.002 mm				
						Percent			
96	90	84	58	16	9	34	9	A–4(9)	ML
95	86	80	66	41	32	50	31	A–7–6(27)	CL
76	58	51	42	23	16	22	8	A–4(2)	CL
97	93	87	74	44	32	56	25	A–7–5(28)	MH
97	95	89	71	36	32	47	26	A–7–6(27)	CL
73	55	50	35	17	13	23	8	A–4(1)	CL
96	89	85	66	30	20	61	29	A–7–5(31)	MH
98	93	88	71	43	33	41	19	A–7–6(19)	CL
75	64	51	38	25	18	25	7	A–4(2)	CL
97	94	90	76	44	29	55	25	A–7–5(22)	MH
88	81	78	65	39	26	35	16	A–6(12)	CL
91	85	82	69	36	27	38	19	A–6(16)	CL
98	94	89	65	32	24	40	14	A–6(13)	ML
93	76	64	40	20	16	37	16	A–6(12)	CL
81	32	20	16	13	12	18	1	A–2–4(0)	SM
95	90	87	66	28	16	32	11	A–6(9)	CL
81	66	63	52	31	26	45	25	A–7–6(26)	CL
43	9	8	6	2	2	----------	[5] NP	A–1–b(0)	SP–SM

soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for use in naming textural classes for soil.

[3] Based on AASHO Designation: M 145–49.

[4] Based on the Unified Soil Classification System (*9*).

[5] NP = nonplastic.

into natural soil. The soil material at a depth between 18 inches and about 6 feet is evaluated. The soil properties considered are those that affect both absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability, depth to water table or rock, and susceptibility to flooding. Slope is a soil property that affects difficulty of layout and construction and also the risk of soil erosion, lateral seepage, and downslope flow of effluent. Large rocks or boulders increase construction costs.

Sewage lagoons are shallow ponds constructed to hold sewage at a depth between 2 and 5 feet long enough for bacteria to decompose the solids. A lagoon has a nearly level floor and its sides, or embankments, are of compacted soil material. It is assumed that the embankment is compacted to medium density and that the pond is protected from flooding. The properties considered are those that affect the pond floor and the embankment. Those that affect the pond floor are permeability, organic-matter content, and slope, and if the floor needs to be leveled, depth to bedrock is important. Soil properties that affect the embankment are the engineering properties of the embankment material (as interpreted from the Unified Soil Classification) and the amount of stones, if any, that influence the ease of excavation and compaction of the embankment material.

Shallow excavations are those that require digging or trenching to a depth of less than 6 feet, as for example, excavations for pipelines, sewerlines, phone- and power-transmission lines, basements, open ditches, and cemeteries. Desirable soil properties are good workability, moderate resistance to sloughing, gentle slope, absence of rock outcrops or big stones, and freedom from flooding or a high water table.

Dwellings without basements are no more than three stories high and are supported by foundation footings placed

TABLE 9.—*Estimated soil properties*

[The symbol > means more than;

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Dominant USDA texture	Classification
				Unified
	Feet	*Inches*		
Barrington: 443A, 443B, 443C2	>3	0–13	Silt loam	ML or CL
		13–32	Silty clay loam and clay loam	CL
		32–66	Silt loam, sandy loam, and loamy sand.	ML or SM
Batavia: 105A, 105B	>3	0–15	Silt loam	CL or ML
		15–48	Silty clay loam and clay loam	CL
		48–70	Silt loam or fine sandy loam	ML or SM
Brenton:				
149	1–3	0–15	Silt loam	CL, ML, or OL
		15–50	Silty clay loam and clay loam	CL
		50–62	Stratified sandy loam and silt loam.	SM, SC, or CL
R149	1–3	0–12	Silt loam	CL or ML
		12–54	Silty clay loam to loam	CL
		54–60	Limestone bedrock [1]	
Bryce: 235	0–1	0–12	Silty clay	CH or MH
		12–32	Silty clay	CH
		32–62	Silty clay	CH or CL
Camden: 134B, 134C2, 134D2	>3	0–14	Silt loam	CL
		14–47	Silty clay loam	CL
		47–72	Sandy loam, loam, or silt loam	ML or SM
Cut and fill land: C.F. Properties too variable to be estimated.				
Del Rey: 192	1–3	0–10	Silt loam	ML or CL
		10–36	Silty clay to silty clay loam	CH or CL
		36–52	Silt loam, sandy loam, silty clay	CL or ML
Dodge: 24A, 24B, 24C2	>3	0–11	Silt loam	ML or CL
		11–35	Silty clay loam, clay loam, and loam.	CL or CH
		35–50	Loam	ML or CL
Dresden: 325A, 325B	>3	0–8	Silt loam	ML or CL
		8–27	Silty clay loam and clay loam	CL
		27–47	Gravel and sand	GP–GM, GP, SP, or SP–SM
Drummer: 152	0–1	0–12	Silty clay loam	CL, CH, or MH
		12–41	Silty clay loam	CL or CH
		41–58	Silt loam, clay loam, loam, or sandy loam.	SM, SC, CL, or ML
DuPage: 321	1–3	0–28	Silt loam and loam	ML
		28–38	Loam or sandy loam	ML or SM
		38–50	Loam, loamy sand, or sandy loam.	ML, CL, or SM
Elburn: 198	1–3	0–13	Silt loam	CL
		13–48	Silty clay loam and silt loam	CL
		48–65	Silt loam and sandy loam	ML or SM
Fox: 327B, 327C2	>3	0–13	Silt loam	ML or CL
		13–33	Silty clay loam and clay loam	CL
		33–40	Gravel and sand	GP or SP, GP–GM, or SP–SM
Gravel pits: G.P. Properties too variable to be estimated.				

significant to engineering

the symbol < means less than]

Classification—Continued	Percentage less than 3 inches passing sieve—			Permeability	Available water capacity	Shrink-swell potential
AASHO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 200 (0.074 mm)			
				Inches per hour	*Inch per inch of soil*	
A–4 or A–6	95–100	95–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.19–0.21	Moderate.
A–4 or A–2	90–100	80–95	30–70	0.6–2.0	0.12–0.23	Low.
A–6 or A–4	95–100	90–100	85–100	0.6–2.0	0.20–0.25	Low.
A–6	95–100	90–100	85–100	0.6–2.0	0.18–0.19	Moderate.
A–2 or A–4	90–100	80–90	25–70	0.6–6.3	0.11–0.19	Low.
A–6 or A–7	100	95–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.18–0.21	Moderate.
A–2, A–4, or A–6	90–100	80–95	30–80	0.6–6.0	0.16–0.18	Low.
A–6 or A–7	100	95–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.18–0.21	Moderate.
A–7	100	95–100	90–100	0.2–0.6	0.19–0.23	High.
A–7	100	95–100	90–100	0.06–0.2	0.11–0.13	High.
A–7 or A–6	95–100	90–100	85–100	0.06–0.2	0.10–0.12	High.
A–6 or A–4	95–100	90–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.16–0.19	Moderate.
A–2 or A–4	90–100	90–100	30–80	0.6–6.0	0.10–0.14	Low.
A–6 or A–4	95–100	95–100	90–100	0.6–2.0	0.20–0.25	Low.
A–7	95–100	90–100	85–100	0.06–0.2	0.15–0.21	Moderate.
A–7 or A–6	90–100	85–100	60–100	0.2–2.0	0.14–0.21	Low.
A–4 or A–6	100	95–100	70–90	0.6–2.0	0.19–0.23	Low.
A–6 or A–7	95–100	90–100	60–86	0.6–2.0	0.16–0.19	Moderate.
A–4 or A–6	90–100	85–100	50–80	0.6–2.0	0.14–0.18	Low.
A–6 or A–4	100	95–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.16–0.19	Moderate.
A–1	40–80	30–70	0–10	6.3–20	0.02–0.04	Low.
A–7 or A–6	95–100	95–100	85–100	0.6–2.0	0.21–0.23	Moderate.
A–7 or A–6	95–100	95–100	85–100	0.6–2.0	0.19–0.21	Moderate.
A–2, A–4, or A–6	85–100	80–100	30–75	0.6–2.0	0.19–0.21	Low.
A–4	90–100	85–95	60–80	0.6–2.0	0.20–0.25	Low.
A–4 or A–2	90–100	85–95	30–70	0.6–2.0	0.18–0.20	Low.
A–4 or A–2	90–100	80–100	25–80	0.6–6.3	0.12–0.20	Low.
A–6	100	100	90–100	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	100	100	95–100	0.6–2.0	0.19–0.21	Moderate.
A–4 or A–2	90–100	80–90	25–60	0.6–6.3	0.14–0.18	Low.
A–4 or A–6	100	95–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.16–0.19	Moderate.
A–1	40–80	30–70	0–10	6.3–20	0.02–0.04	Low.

TABLE 9.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table		Depth from surface	Dominant USDA texture	Classification
					Unified
	Feet		*Inches*		
Harpster: 67		0–1	0–14	Silty clay loam	CL or CH
			14–46	Silty clay loam and clay loam	CL or CH
			46–56	Sandy loam, loam, or silt loam	SM, SC, ML, or CL
Hennepin: 25F, 25G		>3	0–14	Loam or silt loam	ML or CL
			14–50	Loam	ML or CL
Houghton: 103		(2)	0–51	Muck	Pt
Kendall: 242		1–3	0–12	Silt loam	CL
			12–40	Silty clay loam and clay loam	CL
			40–72	Clay loam, silt loam, loam, and sandy loam	CL, SM, or ML
Knight: 191		(3)	0–37	Silt loam	CL or OL
			37–72	Silty clay loam and clay loam	CL
			72–75	Loam and sandy loam	ML or SM
Landes: 304		1–3	0–75	Fine sandy loam, loamy fine sand, and sand.	SM or SP
La Rose: 60B2, 60C2, 60C3, 60D3		>3	0–8	Silt loam	ML or CL
			8–16	Silty clay loam or clay loam	CL
			16–51	Loam or silt loam	ML or CL
Lena: 210		(2)	0–104	Muck	Pt
Lisbon: 59		1–3	0–14	Silt loam	CL or ML
			14–47	Silty clay loam and clay loam	CL
			47–58	Loam or silt loam	ML or CL
Lorenzo: 318C, 318D2, 318F		>3	0–7	Loam	ML
			11–16	Gravelly loam	CL
			16–50	Sandy loam and loamy gravel	SP, SM, GM, or SP–SM
Martinton: 189A, 189B		1–3	0–12	Silt loam and silty clay loam	ML or CL
			12–42	Silty clay and silty clay loam	CL or CH
			42–68	Loam to silty clay	CL or CH
Milford:					
69		0–1	0–16	Silty clay loam and silty clay	MH, CH, or CL
			16–42	Silty clay and silty clay loam	CH or CL
			42–64	Silty clay loam, silt loam, loam and silty clay.	CH or CL
R69		0–1	0–17	Silty clay loam	CH or CL
			17–48	Heavy silty clay loam to loam	CH or CL
			48–50	Limestone bedrock.[1]	
Millbrook: 219		1–3	0–13	Silt loam	CL
			13–43	Silty clay loam and clay loam	CL
			43–61	Silt loam, sand, and sandy loam	SM, ML, or SC
Millington: 82		1–3	0–66	Loam to silt loam	ML or CL
Mundelein: 442		1–3	0–11	Silt loam	ML or CL
			11–34	Silty clay loam or clay loam	CL
			34–55	Silt loam, clay loam, and sand	ML, CL, SM, or SC
Nappanee: 228A, 228B		1–3	0–13	Silt loam	CL or ML
			13–32	Silty clay and clay	CH
			32–75	Silty clay to clay	CH or CL
Peotone: 330		(3)	0–18	Silty clay loam	MH, CL, or CH
			18–39	Silty clay to silty clay loam	CL or CH
			39–68	Silt loam	CL
Plano: 199A, 199B, 199C2		>3	0–14	Silt loam	CL or ML
			14–52	Silty clay loam and silt loam	CL
			52–80	Loam to sandy loam	ML or SM

significant to engineering—Continued

Classification—Continued	Percentage less than 3 inches passing sieve—			Permeability	Available water capacity	Shrink-swell potential
AASHO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 200 (0.074 mm)			
				Inches per hour	*Inch per inch of soil*	
A–7	95–100	95–100	70–100	0.6–2.0	0.19–0.23	Moderate.
A–7 or A–6	95–100	80–100	65–100	0.6–2.0	0.16–0.19	Moderate.
A–2, A–4, or A–6	90–100	80–100	30–100	0.6–2.0	0.10–0.19	Low.
A–4 or A–6	95–100	90–100	70–90	0.6–2.0	0.17–0.20	Low.
A–4 or A–6	90–100	90–100	60–80	0.6–2.0	0.10–0.16	Low.
(1)	(1)	(1)	(1)	2.0–6.0	>0.25	Low.
A–6	100	90–100	90–100	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	85–100	0.6–2.0	0.18–0.20	Moderate.
A–2, A–4, or A–6	90–100	80–90	25–85	0.6–6.3	0.14–0.18	Low.
A–6	95–100	90–100	80–90	0.2–0.6	0.20–0.22	Moderate.
A–6	95–100	90–100	75–90	0.2–0.6	0.18–0.20	Moderate.
A–2 or A–4	90–100	85–95	30–60	0.6–2.0	0.14–0.18	Moderate to low.
A–2 or A–3	95–100	90–100	0–25	6.3–20	0.08–0.14	Low.
A–6 or A–4	100	95–100	85–100	0.6–2.0	0.20–0.22	Low.
A–6 or A–7	95–100	90–100	65–85	0.6–2.0	0.16–0.18	Moderate.
A–4 or A–6	95–100	85–90	60–75	0.2–1.0	0.14–0.18	Low.
(1)	(1)	(1)	(1)	0.6–6.3	>0.25	Low.
A–6 or A–7	100	95–100	90–100	0.6–2.0	0.20–0.25	Low.
A–7 or A–6	95–100	90–100	70–95	0.6–2.0	0.16–0.19	Moderate.
A–4 or A–6	95–100	85–95	60–80	0.2–1.0	0.14–0.18	Low.
A–4	100	95–100	65–90	0.6–2.0	0.16–0.20	Low.
A–6	80–100	80–100	60–90	0.6–2.0	0.15–0.19	Low.
A–2 or A–1	70–80	30–45	0–10	6.3–20	0.02–0.04	Low.
A–6 or A–7	100	95–100	90–100	0.6–2.0	0.22–0.25	Low.
A–7	100	95–100	90–100	0.2–0.6	0.15–0.19	Moderate.
A–6 or A–7	95–100	90–100	80–90	0.2–2.0	0.14–0.19	Low.
A–7	95–100	95–100	90–100	0.6–2.0	0.19–0.23	High.
A–7	95–100	95–100	90–100	0.2–0.6	0.11–0.13	High.
A–7, A–6, or A–4	85–100	80–100	60–90	0.2–0.6	0.14–0.19	Moderate to high.
A–7	95–100	95–100	90–100	0.6–2.0	0.19–0.23	High.
A–7	95–100	95–100	90–100	0.2–0.6	0.19–0.21	High.
A–6 or A–7	100	95–100	90–100	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	100	90–100	60–90	0.6–2.0	0.18–0.20	Moderate.
A–2 or A–4	95–100	90–100	30–80	0.6–2.0	0.12–0.18	Low.
A–4 or A–6	90–100	80–90	50–90	0.6–2.0	0.16–0.20	Moderate.
A–4 or A–6	95–100	95–100	80–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.18–0.20	Moderate.
A–4, A–2, or A–6	90–100	80–95	30–70	0.6–2.0	0.14–0.18	Low.
A–6	95–100	95–100	90–100	0.2–0.6	0.20–0.24	Low.
A–7	95–100	90–100	85–100	<0.06	0.09–0.13	Moderate.
A–7	95–100	90–100	85–100	<0.06	0.08–0.12	Moderate.
A–7	95–100	90–100	85–100	0.6–2.0	0.19–0.23	Moderate.
A–7 or A–6	95–100	90–100	80–100	0.2–0.6	0.18–0.20	High.
A–6 or A–7	95–100	90–100	80–100	0.2–0.6	0.18–0.20	Moderate.
A–6 or A–4	100	100	90–100	0.6–2.0	0.20–0.25	Low.
A–6	100	100	75–100	0.6–2.0	0.19–0.21	Moderate.
A–4 or A–2	90–100	90–100	25–60	0.6–6.3	0.10–0.14	Low.

TABLE 9.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Dominant USDA texture	Classification
				Unified
	Feet	*Inches*		
Plattville: 240A, 240B	>3	0–12	Silt loam	CL or ML
		12–44	Silty clay loam	CL
		44	Limestone bedrock.[1]	
Proctor: 148A, 148B, 148C2	>3	0–14	Silt loam	CL or ML
		14–53	Silty clay loam and clay loam	CL
		53–60	Stratified sandy loam, sand, and silt loam.	SM, SC, or CL
Ripon: 324B, 324C2	>3	0–11	Silt loam	ML
		11–29	Silty clay loam and clay loam	CL
		29	Limestone bedrock.[1]	
Rush: 791A, 791B	>3	0–13	Silt loam	ML or CL
		13–45	Silty clay loam to gravelly clay loam.	CL
		45–52	Gravel and sand	GP, SP, GP-GM, or SP-SM
St. Charles: 243A, 243B, 243C2	>3	0–10	Silt loam	CL or ML
		10–58	Silty clay loam and clay loam	CL
		58–64	Loam to sandy loam	ML or SM
Sawmill: 107	0–1	0–30	Silty clay loam	CL, CH, or OH
		30–57	Silty clay loam	CL or CH
		57–73	Sandy loam, loam, and clay loam.	SM or CL
Saybrook: 145A, 145B, 145B2, 145C2	>3	0–11	Silt loam	CL or OL
		11–45	Silty clay loam and silt loam	CL
		45–57	Silt loam and loam	CL or ML
Sparta: 88C	>3	0–11	Loamy fine sand	SM
		11–35	Loamy sand and sand	SP-SM
		35–60	Sand	SP
Strawn: 224C, 224C2, 224C3, 224D2, 224D3, 224F.	>3	0–5	Silt loam	ML or CL
		5–16	Silty clay loam or clay loam	CL
		16–50	Loam or silt loam	ML or CL
Swygert: 91A, 91B, 91C2	1–3	0–13	Silty clay loam	CL or OL
		13–41	Silty clay	CH
		41–66	Silty clay and clay	CH
Thorp: 206	[2]	0–15	Silt loam	CL or OL
		15–42	Silty clay loam	CL
		42–97	Sandy loam, loam, or silt loam	SM or CL
Varna: 223B, 223C2, 223D3	>3	0–13	Silt loam	CL or ML
		13–35	Heavy silty clay loam and silty clay.	CL or CH
		35–50	Silty clay loam	CL
Virgil: 104	1–3	0–14	Silt loam	CL
		14–62	Silty clay loam and clay loam	CL
		62–80	Silt loam to sandy loam	ML or SM
Waupecan: 369A, 369B	>3	0–12	Silt loam	CL
		12–43	Silty clay loam to sandy loam	CL
		43–52	Loamy sand, sand, and gravel	ML to GP or SP

[1] Estimates not given for limestone rock or organic soil material.
[2] Subject to ponding.

significant to engineering—Continued

Classification—Continued	Percentage less than 3 inches passing sieve—			Permeability	Available water capacity	Shrink-swell potential
AASHO	No. 4 (4.7 mm)	No. 10 (2.0 mm)	No. 200 (0.074 mm)			
				Inches per hour	*Inch per inch of soil*	
A–6 or A–4	100	95–100	90–95	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	95–100	85–95	0.6–2.0	0.18–0.20	Moderate.
A–6 or A–4	100	95–100	80–90	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	60–90	0.6–2.0	0.18–0.20	Moderate.
A–2, A–4, or A–6	90–100	80–95	30–75	0.6–6.3	0.10–0.14	Low.
A–6	100	95–100	70–90	0.6–2.0	0.16–0.20	Low to moderate.
A–6 or A–7	90–100	85–95	60–80	0.6–2.0	0.16–0.20	Moderate.
A–4 or A–6	100	95–100	85–95	0.6–2.0	0.20–0.25	Low.
A–6	90–100	80–100	60–90	0.6–2.0	0.16–0.19	Moderate.
A–1	40–80	30–70	0–10	6.3–20	0.02–0.04	Low.
A–6 or A–4	100	90–100	90–100	0.6–2.0	0.20–0.25	Low.
A–6	95–100	90–100	85–100	0.6–2.0	0.18–0.20	Moderate.
A–2 or A–4	90–100	80–90	25–60	0.6–6.3	0.10–0.14	Low.
A–7	100	95–100	90–100	0.6–2.0	0.19–0.23	Moderate.
A–6 or A–7	95–100	90–100	80–100	0.6–2.0	0.19–0.21	Moderate.
A–4, A–6, or A–2	95–100	90–100	30–80	0.6–2.0	0.12–0.16	Low.
A–6	100	95–100	90–100	0.6–2.0	0.20–0.25	Low.
A–7 or A–6	95–100	90–100	70–95	0.6–2.0	0.16–0.19	Moderate.
A–4 or A–6	95–100	85–95	60–75	0.2–2.0	0.14–0.18	Low.
A–2	100	100	20–25	2.0–6.3	0.10–0.12	Low.
A–3	100	100	5–10	>20	0.06–0.08	Low.
A–3	100	100	1–4	>20	0.05–0.07	Low.
A–4 or A–6	100	90–100	80–100	0.6–2.0	0.20–0.25	Low.
A–6 or A–7	95–100	90–100	70–95	0.6–2.0	0.16–0.18	Moderate.
A–4 or A–6	95–100	85–95	55–75	0.6–2.0	0.14–0.18	Low.
A–6 or A–7	95–100	95–100	90–100	0.2–0.6	0.19–0.23	Low to moderate.
A–7	95–100	90–100	85–100	0.06–0.2	0.11–0.13	High.
A–7	95–100	90–100	85–100	0.06–0.2	0.10–0.12	High.
A–6 or A–7	95–100	90–100	80–90	0.6–2.0	0.22–0.24	Low.
A–6 or A–7	95–100	90–100	75–90	0.06–0.2	0.18–0.20	Moderate.
A–2, A–4, or A–6	90–100	85–95	25–90	0.6–2.0	0.06–0.12	Low.
A–6 or A–7	100	95–100	80–95	0.6–2.0	0.20–0.24	Low.
A–7 or A–6	95–100	90–100	80–95	0.2–0.6	0.15–0.21	Moderate.
A–7 or A–6	95–100	90–100	80–95	0.2–0.6	0.18–0.20	Low.
A–6	100	100	90–100	0.6–2.0	0.22–0.24	Low.
A–6 or A–7	100	100	95–100	0.6–2.0	0.16–0.19	Moderate.
A–4	90–100	60–90	40–60	0.6–6.3	0.14–0.18	Low.
A–6	100	100	85–95	0.6–2.0	0.22–0.24	Low.
A–6 or A–7	90–100	95–100	50–80	0.6–2.0	0.16–0.19	Moderate.
A–1	40–80	40–90	5–15	6.3–20	0.02–0.04	Low.

[3] Water table is at or near surface.

TABLE 10.—*Interpretations of*

Soil series and map symbols	Degree and kind of limitation for—				Suitability as a source of—
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sand and gravel
Barrington: 443A, 443B, 443C2.	Slight	Severe: porous material below depth of 3 to 4 feet.	Slight	Slight	Poor above depth of 50 inches, poor to fair below that depth: fines in some places.
Batavia: 105A, 105B	Slight	Severe: porous material below depth of 4 feet in many areas.	Slight	Slight	Fair: excessive fines in lower part of profile.
Brenton: 149, R149	Severe: seasonal high water table. Moderate in places.	Severe: porous material below depth of 3 to 4 feet; high water table; rock at depth of 4 to 5 feet in R149.	Severe: sidewalls unstable in some horizons below depth of 3 feet; high water table.	Moderate: seasonal high water table; subject to frost heave; rock at depth of 4 to 5 feet in R149.	Poor above depth of 50 inches, poor to fair below that depth: fines in some places; limestone at depth of 4 to 5 feet in R149.
Bryce: 235	Severe: high water table; slow permeability.	Severe: high water table.	Severe: fine textured; high water table.	Severe: high water table; high clay content; slow water runoff.	Not suitable
Camden: 134B, 134C2, 134D2.	Slight for 134B and 134C2. Moderate for 134D2: slope.	Severe: porous material below depth of 3 to 4 feet; slope.	Slight for 134B and 134C2. Moderate for 134D2: slope.	Slight for 134B and 134C2. Moderate for 134D2: slope.	Poor above depth of 50 inches. Fair below that depth: fines in some places.
Cut and fill land: C.F. No interpretations made; properties too variable.					
Del Rey: 192	Severe: seasonal high water table; slow permeability.	Severe: seasonal high water table.	Severe: high clay content; high water table.	Moderate: seasonal high water table; subject to frost heave.	Not suitable
Dodge: 24A, 24B, 24C2	Slight	Moderate: hazard of seepage; slope if more than 2 percent.	Slight	Slight	Not suitable
Dresden: 325A, 325B	Slight: risk of polluting nearby water supply.	Severe: very porous material below depth of 3 feet.	Moderate: sidewalls unstable below depth of 3 feet.	Slight	Good: variable thickness and quality.

engineering properties of soils

Suitability as a source of—Continued	Soil factors affecting—				
Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland	Irrigation	Terraces and diversions
Fair: limited depth of good surface material.	Seepage hazard; too permeable below depth of 3 feet in most places.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	No limitations, except topography in some places.
Fair: limited depth of good surface material.	Seepage hazard; too permeable below depth of 4 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; high available water capacity.	No limitations.
Fair: limited depth of good surface material.	Seepage hazard; too permeable below depth of 3 feet in most places; limestone at depth of 4 to 5 feet in R149.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 foot to 3 feet; subsurface needs drainage tile in places.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Poor: high clay content; poorly drained.	Natural high water table for dugout ponds; sandy strata below depth of 5 feet in places.	Poor stability and compaction characteristics; impervious when compacted; high volume change.	Slow permeability; standing water in wet seasons; use of tile questionable.	Slow intake rate; slow permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Seepage hazard; too permeable below depth of 3 feet in most places.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	Exposed subsoil acid; low organic-matter content.
Poor: very limited depth of good surface material.	Features generally favorable; seasonal high water table; may be sandy strata below depth of 5 feet.	Poor to fair stability and compaction characteristics; impervious when compacted; high volume change.	Slow permeability; water table at depth of 1 foot to 3 feet; use of tile drains questionable.	Slow intake rate; slow permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Moderate permeability.	Good to fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	Erosion hazard on moderate slopes.
Poor: very limited depth of good surface material.	Material too porous to hold water.	Sandy and gravelly material; poor resistance to piping; rapid seepage.	Good natural drainage.	Moderate intake rate; moderately rapid permeability; moderate available water capacity.	Not needed because of moderate permeability in upper layer and topography.

TABLE 10.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—				Suitability as a source of—
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sand and gravel
Drummer: 152	Severe: high water table.	Severe: high water table.	Severe: sidewalls unstable below depth of 3 feet; high water table.	Severe: high water table; slow runoff.	Poor above depth of 50 inches. Fair below that depth. Good below depth of 50 inches in areas north of river.
DuPage: 321	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; sidewalls unstable.	Severe: subject to flooding.	Not suitable
Elburn: 198	Severe: seasonal high water table. Moderate in places.	Severe: porous material below depth of 4 feet; high water table.	Severe: sidewalls unstable in some horizons below depth of 3 feet; high water table.	Moderate: seasonal high water table; hazard of frost heave.	Poor to not suitable: may have sandy material below depth of 50 inches.
Fox: 327B, 327C2	Slight: risk of polluting nearby water supply.	Severe: very porous material below depth of 3 feet.	Moderate: sidewalls unstable below depth of 3 feet.	Slight	Good: variable thickness and quality.
Gravel pits: G.P. No interpretations made; properties too variable.					
Harpster: 67	Severe: high water table; hazard of ponding.	Severe: high water table.	Severe: high water table; sidewalls unstable in some places below depth of 3 feet.	Severe: high water table; slow runoff.	Poor above depth of 50 inches, poor to fair below that depth: contains fines in some places.
Hennepin: 25F, 25G	Severe: steep	Severe: steep	Severe: steep	Severe: steep	Not suitable
Houghton: 103	Severe: hazard of flooding and ponding; unstable organic material.	Severe: very unsuitable material; very high water table.	Severe: unstable material; very high water table.	Severe: very unsuitable material; severe hazard of wetness.	Not suitable
Kendall: 242	Severe: seasonal high water table. Moderate in places.	Severe: porous material below depth of 4 feet; high water table.	Severe: sidewalls unstable in some horizons below depth of 3 feet; high water table.	Moderate: seasonal high water table; hazard of frost heave.	Poor to not suitable: thin layers below depth of 50 inches.
Knight: 191	Severe: subject to ponding; very high water table.	Severe: high water table; hazard of ponding.	Severe: high water table; sidewalls unstable in some horizons below depth of 3 feet.	Severe: hazard of flooding or ponding; high water table.	Not suitable

properties of soils—Continued

Suitability as a source of—Continued	Soil factors affecting—				
Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland	Irrigation	Terraces and diversions
Poor: poorly drained	Natural high water table for dugout ponds; too porous below depth of 5 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; standing water in wet seasons; tile drainage is satisfactory with good outlets.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Good for surface layer	Hazard of seepage; very rapid permeability below depth of 3 feet.	Poor resistance to piping; sandy material; rapid seepage.	Moderate permeability; subject to flooding.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of topography.
Good for surface layer	Hazard of seepage; very rapid permeability below depth of 4 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 to 3 feet; subsurface drainage with tile where needed.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Poor: very limited depth of good surface material.	Material too porous to hold water.	Sandy and gravelly material; poor resistance to piping; rapid seepage.	Good natural drainage.	Moderate intake rate; moderately rapid permeability; moderate available water capacity.	Sandy and gravelly substratum; difficult to vegetate; topography is a limitation in many places.
Poor: poorly drained	Natural high water table for dugout ponds; too porous below depth of 5 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; standing water in wet seasons; tile drainage is satisfactory with good outlets.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Poor: very thin surface; steep slopes.	Slope may limit water storage.	Fair stability and compaction characteristics; fair resistance to piping.	Good natural drainage.	Steep; severe erosion hazard; moderate to rapid intake rate.	Not suitable because of steepness.
Poor: possible source of organic material for mulching.	Natural high water table for dugout ponds.	Not suitable: organic material.	Subject to ponding; unstable for tile lines; adequate outlets scarce.	Rapid intake rate; minimum amount of water needed.	Not needed because of level topography.
Fair: limited depth of good surface material.	Hazard of seepage; too permeable below depth of 4 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 to 3 feet; subsurface drainage with tile where needed.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Poor: poorly drained	Natural pond site; high water table.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderately slow permeability; standing water in wet seasons; tile outlets scarce.	Moderate intake rate; minimum amount of water needed.	Not needed because of level topography.

TABLE 10.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—				Suitability as a source of—
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sand and gravel
Landes: 304	Severe: subject to flooding.	Severe: subject to flooding; very porous material.	Severe: subject to flooding; sidewalls unstable.	Severe: subject to flooding.	Fair for sand: variable thicknesses; contains fines in some places. Not suitable for gravel.
La Rose: 60B2, 60C2, 60C3, 60D3.	Moderate: moderate permeability.	Moderate for 60B2, 60C2, and 60C3: slope; moderate permeability. Severe for 60D3: slope.	Slight for 60B2, 60C2, and 60C3. Moderate for 60D3: slope.	Moderate frost action and shrink-swell potential.	Not suitable
Lena: 210	Severe: flooding and ponding are common.	Severe: very unsuitable material; very high water table.	Severe: unstable material; very high water table.	Severe: very unsuitable material; hazard of wetness.	Not suitable
Lisbon: 59	Severe: seasonal high water table. Moderate in places.	Severe: seasonal high water table; hazards of seepage in places.	Severe: high water table.	Moderate: seasonal high water table; hazard of frost heave.	Not suitable
Lorenzo: 318C, 318D2, 318F.	Moderate for 318C and 318D2: slope. Severe for 318F: slope.	Severe: very porous material below depth of 2 feet.	Slight for 318C. Moderate for 318D2: unstable trenches. Severe for 318F: slope.	Slight for 318C. Moderate for 318D2. Severe for 318F: slope.	Good: variable thickness and quality.
Martinton: 189A, 189B	Severe: seasonal high water table; moderately slow permeability.	Severe: seasonal high water table.	Severe: high clay content; seasonal high water table.	Moderate: seasonal high water table; subject to frost heave.	Not suitable
Milford: 69, R69	Severe: seasonal high water table; moderately slow permeability.	Severe: high water table.	Severe: high water table; high clay content.	Severe: hazard of wetness; slow runoff.	Not suitable
Millbrook: 219	Severe: seasonal high water table. Moderate in places.	Severe: porous material below depth of 3 to 4 feet; high water table.	Severe: sidewalls unstable in some horizons below depth of 3 feet; high water table.	Moderate: seasonal high water table; hazard of frost heave.	Not suitable
Millington: 82	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; sidewalls unstable.	Severe: subject to flooding; high water table.	Not suitable
Mundelein: 442	Severe: seasonal high water table. Moderate in places.	Severe: porous material at depth of 3 to 4 feet; high water table.	Severe: sidewalls unstable in some horizons below depth of 3 feet; high water table.	Moderate: seasonal high water table; hazard of frost heave.	Not suitable

properties of soils—Continued

Suitability as a source of—Continued	Soil factors affecting—				
Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland	Irrigation	Terraces and diversions
Good for surface layers.	Hazards of seepage; too permeable.	Poor resistance to piping; sandy material; rapid seepage.	Rapid permeability; some areas need leveling.	Rapid intake rate; low available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Features generally favorable; good topography locations are scarce.	Good to fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	No limitations, except for topography in places.
Poor: possible source of organic material for mulching.	Natural high water table for dugout ponds.	Not suitable: organic material.	Ponding is common; unstable for tile lines, adequate outlets scarce.	Moderate to rapid intake rate; minimum amount of water needed.	Not needed because of level topography.
Fair: limited depth of good surface material.	Features generally favorable; seasonal high water table.	Good to fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 to 3 feet; subsurface drain with tile where needed.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Poor: very limited depth of good surface material.	Material too porous to hold water.	Sandy and gravelly material; poor resistance to piping; rapid seepage.	Good natural drainage.	Rapid intake rate; rapid permeability; erosion hazard on slopes.	Not needed because of rapid permeability and topography.
Fair: limited depth of good surface material.	Features generally favorable; seasonal high water table; sandy strata below depth of 5 feet in places.	Poor to fair stability and compaction characteristics; impervious when compacted; high volume change.	Moderately slow permeability; water table at depth of 1 to 3 feet; use of tile questionable.	Moderate intake rate; moderately slow permeability; high available water capacity.	Not needed because of level topography.
Poor: poorly drained; high clay content.	Features generally favorable; natural high water table for dugout ponds; sandy strata below depth of 5 feet in places.	Poor to fair stability and compaction characteristics; impervious when compacted; high volume change.	Moderately slow permeability; standing water in wet seasons; use of tile questionable.	Moderate intake rate; moderately slow permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Hazard of seepage; very rapid permeability below depth of 3 feet in most areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 to 3 feet; subsurface drainage with tile where needed.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Good: high content of snail shells; calcareous material.	Hazard of seepage; high water table; good for dugout ponds.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; subject to flooding; tile can be used with adequate outlets.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Hazard of seepage; very rapid permeability below depth of 3 feet in most areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 to 3 feet; subsurface drainage with tile where needed.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.

TABLE 10.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—				Suitability as a source of—
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sand and gravel
Nappanee: 228A, 228B	Severe: very slow permeability; seasonal high water table.	Severe: seasonal high water table. Moderate in places.	Severe: high clay content; seasonal high water table.	Severe: seasonal high water table; high clay content.	Not suitable
Peotone: 330	Severe: high water table; subject to ponding.	Severe: high water table; subject to ponding.	Severe: high water table; high clay content.	Severe: high water table; subject to frequent ponding.	Not suitable
Plano: 199A, 199B, 199C2	Slight	Severe: porous material below depth of 4 feet in many areas.	Slight	Slight	Poor to not suitable
Plattville: 240A, 240B	Moderate: bedrock at depth of 3 to 5 feet; risk of polluting nearby water supply.	Moderate: bedrock at depth of 3 to 5 feet; risk of polluting nearby water supply.	Moderate: bedrock at depth of 3 to 5 feet.	Moderate: bedrock at depth of 3 to 5 feet.	Not suitable
Proctor: 148A, 148B, 148C2.	Slight	Severe: porous material below depth of 3 to 4 feet.	Slight	Slight	Poor for sand below depth of 50 inches: contains fines. Not suitable for gravel.
Ripon: 324B, 324C2	Severe: bedrock at depth of 20 to 40 inches; risk of polluting nearby water supply.	Severe: bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.	Severe: bedrock at depth of 20 to 40 inches.	Not suitable
Rush: 791A, 791B	Slight: risk of polluting nearby water supply.	Severe: very porous material below depth of 4 feet.	Moderate: sidewalls unstable below depth of 4 feet.	Slight	Good: variable thickness and quality.
St. Charles: 243A, 243B, 243C2.	Slight	Severe: porous material below depth of 4 feet in many areas.	Slight	Slight	Not suitable
Sawmill: 107	Severe: subject to flooding.	Severe: subject to flooding.	Severe: subject to flooding; high water table.	Severe: subject to flooding.	Not suitable
Saybrook: 145A, 145B, 145B2, 145C2.	Moderate: permeability 45 to 60 minutes per inch.	Moderate where slope is more than 2 percent.	Moderate: shrink-swell potential; plasticity index is more than 15.	Slight	Not suitable

properties of soils—Continued

Suitability as a source of—Continued	Soil factors affecting—				
Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland	Irrigation	Terraces and diversions
Poor: very limited depth of good surface material.	Features generally favorable; unfavorable watershed characteristics.	Poor stability and compaction characteristics; impervious when compacted; high volume change.	Very slow permeability; water table at depth of 1 to 3 feet; slow to dry.	Slow intake rate; very slow permeability; moderate available water capacity.	Not needed because of level topography.
Poor: very poorly drained; high clay content.	Features generally favorable; high water table for dugout ponds.	Poor to fair stability and compaction characteristics; impervious when compacted; high volume change.	Moderately slow permeability; subject to ponding in wet seasons; drainage outlets inadequate.	Moderate intake rate; moderately slow permeability; very high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface layer.	Hazard of seepage; very rapid permeability below depth of 4 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; high available water capacity.	Slight limitations because of erosion hazard.
Fair: limited depth of good surface layer.	Features generally unfavorable because of bedrock.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; high available water capacity.	No limitations, except that bedrock at depth of 3 to 5 feet limits the depth of cuts.
Fair: limited depth of good surface material.	Hazard of seepage; very rapid permeability below depth of 3 feet in most areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	No limitations, except for erosion in some areas.
Fair: limited depth of good surface layer.	Features unfavorable because of shallowness to bedrock.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; moderate available water capacity.	Very limited use because of shallow depth to bedrock.
Fair: limited depth of good surface material.	Material too porous to hold water.	Sandy and gravelly material below depth of 4 feet; poor resistance to piping; rapid seepage.	Good natural drainage.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of moderate permeability and topography.
Fair: limited depth of good surface material.	Hazard of seepage; very rapid permeability below depth of 4 feet in many areas.	Fair stability and compaction characteristics; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; high available water capacity.	Erosion hazard in sloping areas.
Fair: sticky when wet	Features generally favorable for dugout ponds; high water table.	Poor to fair stability and compaction characteristics; impervious when compacted; high volume change.	Moderate permeability; subject to flooding and ponding; tile drains can be used with adequate outlets.	Moderate intake rate; moderately slow permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Features generally favorable.	Good to fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	No limitation, except for topography in some areas.

TABLE 10.—*Interpretations of engineering*

Soil series and map symbols	Degree and kind of limitation for—				Suitability as a source of—
	Septic tank absorption fields	Sewage lagoons	Shallow excavations	Dwellings without basements	Sand and gravel
Sparta: 88C	Moderate: risk of polluting nearby water supply.	Severe: very porous material.	Moderate: loose sandy material; side slopes unstable.	Slight	Good for sand. Not suitable for gravel.
Strawn: 224C, 224C2, 224C3, 224D2, 224D3, 224F.	Severe for 224F: slope. Moderate for other units: moderate permeability.	Moderate for 224C, 224C2, and 224C3: moderate permeability; slope. Severe for 224D2, 224D3, and 224F: slope.	Slight for 224C, 224C2, and 224C3. Moderate for 224D2 and 224D3: moderate permeability; slope. Severe for 224F: slope.	Slight for 224C, 224C2, and 224C3. Moderate for 224D2, 224D3, and 224F: slope.	Not suitable
Swygert: 91A, 91B, 91C2	Severe: slow permeability; seasonal high water table.	Severe: seasonal high water table.	Severe: high clay content; seasonal high water table.	Severe: seasonal high water table; high clay content.	Not suitable
Thorp: 206	Severe: very high water table; subject to ponding.	Severe: high water table; subject to ponding.	Severe: high water table; unstable layers below depth of 3 feet.	Severe: very high water table; subject to ponding.	Fair: poor above depth of 50 inches. Fair to poor below that depth.
Varna: 223B, 223C2, 223D3.	Severe: moderately slow permeability.	Moderate for 223B and 223C2: slope. Severe for 223D3: slope.	Slight for 223B and 223C2. Moderate for 223D3: slope.	Moderate: high clay content.	Not suitable
Virgil: 104	Severe: seasonal high water table. Moderate in places.	Severe: porous material below depth of 4 feet; high water table.	Severe: sidewalls unstable in some places below depth of 3 feet; high water table.	Moderate: seasonal high water table; hazard of frost heave.	Not suitable
Waupecan: 369A, 369B	Slight: risk of polluting nearby water supply.	Severe: very porous material below depth of 4 feet.	Slight: sidewalls unstable below depth of 4 feet.	Slight	Good: variable thickness and quality.

in undisturbed soil. The features that affect the degree of limitation of a soil for dwellings are those that relate to capacity to support load and resist settlement under load and those that relate to ease of excavation. Soil properties that affect capacity to support load are wetness, susceptibility to flooding, density, plasticity, texture, and shrink-swell potential. Those that affect excavation are wetness, slope, depth to bedrock, and content of stones and rocks.

Sand and gravel are used in great quantities in many kinds of construction. The suitability ratings in table 10 provide guidance about where to look for probable sources. A soil that is rated as a *good* or *fair* source of sand or gravel generally has a layer at least 3 feet thick, the top of which is within a depth of 6 feet. The ratings do not take into account thickness of overburden, location of the water table, or other factors that affect mining of the materials, and neither do they indicate quality of the deposit.

Topsoil is used for topdressing an area where vegetation is to be established and maintained. Suitability is affected mainly by ease of working and spreading the soil material, as for preparing a seedbed; natural fertility of the material, or the response of plants when fertilizer is applied; and absence of substances toxic to plants. Texture of the soil material and the content of stone fragments are character-

properties of soils—Continued

Suitability as a source of—Continued	Soil factors affecting—				
Topsoil	Pond reservoir areas	Embankments, dikes, and levees	Drainage of cropland	Irrigation	Terraces and diversions
Poor: too sandy; low available water capacity.	Material too porous to hold water.	Sandy material; rapid seepage; poor resistance to piping.	Good natural drainage.	Very rapid intake rate; rapid permeability; low available water capacity.	Not needed because of very rapid permeability.
Poor: very limited depth of good surface material.	Features generally favorable; sites that have good topography are limited.	Good to fair stability and compaction characteristics; impervious when compacted; medium volume change.	Good natural drainage.	Moderate intake rate; moderate permeability; erosion hazard in sloping areas.	Difficult to vegetate; hazard of erosion.
Poor: limited depth of good surface material; high clay content.	Features generally favorable for dugout ponds; sandy strata below depth of 5 feet in places.	Poor stability and compaction characteristics; impervious when compacted; high volume change.	Slow permeability; water table at depth of 1 to 3 feet; slow to dry.	Slow intake rate; slow permeability; high available water capacity.	Not needed because of level topography.
Poor: poorly drained; limited depth of good material.	Natural high water table for dugout ponds; material too porous below depth of 5 feet in many places if water table is lowered.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Slow permeability; standing water in wet seasons; tile drainage is satisfactory with good outlets.	Slow intake rate; slow permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material. Poor for 223D3.	Features generally favorable.	Poor to fair stability and compaction characteristics; impervious when compacted; high volume change.	Good natural drainage.	Moderate intake rate; moderately slow permeability; high available water capacity.	Exposed subsoil difficult to vegetate.
Fair: limited depth of good surface material.	Hazard of seepage; too permeable below depth of 4 feet in many areas.	Fair stability and compaction characteristics; impervious when compacted; medium volume change.	Moderate permeability; water table at depth of 1 to 3 feet; subsurface drainage with tile where needed.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of level topography.
Fair: limited depth of good surface material.	Material too porous to hold water.	Sandy and gravelly material below depth of 4 feet; poor resistance to piping; rapid seepage.	Good natural drainage.	Moderate intake rate; moderate permeability; high available water capacity.	Not needed because of moderate permeability and topography.

istics that affect suitability, but also considered in the ratings is damage that will result at the area from which topsoil is taken.

Pond reservoir areas hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and depth to fractured or permeable bedrock or other permeable material.

Embankments, dikes, and levees require soil material resistant to seepage and piping and of favorable stability, shrink-swell potential, shear strength, and compactibility. Presence of stones or organic material in a soil are among the unfavorable factors.

Drainage of cropland is affected by such soil properties as permeability, texture, and structure; depth to claypan, rock, or other layers that affect the rate of water movement; depth to the water table; slope; stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

Irrigation of a soil is affected by such features as slope; susceptibility to stream overflow, water erosion, or soil blowing; soil texture; content of stones; accumulation of salts and alkali; depth of root zone; rate of water intake at the surface; permeability of soil layers below the surface layer and in fragipans or other layers that restrict movement

of water; amount of water held available to plants; and need for drainage, or depth to water table or bedrock.

Terraces and diversions are embankments, or ridges, constructed across the slope to intercept runoff so that it soaks into the soil or flows slowly to a prepared outlet. Features that affect suitability of a soil for terraces are uniformity and degree of slope; depth to bedrock or other unfavorable material; presence of stones; permeability; and resistance to water erosion, soil slipping, and soil blowing. A soil suitable for these structures provides outlets for runoff and is not difficult to vegetate.

Formation and Classification of the Soils

This section consists of two main parts. The first tells how the factors of soil formation have affected the development of soils in Kendall County. The second explains the system of soil classification currently used and places each soil series in the classes of that system.

Factors of Soil Formation

The principal factors of soil formation are parent material, climate, plants and animals, relief and drainage, and time. All five factors affect the formation of every soil. The relative importance of each factor differs from place to place, and each modifies the effect of the other four. In some places one factor may be dominant.

Parent material

Parent material in Kendall County is mainly glacial in origin and Wisconsinan in age. The parent materials of glacial origin are till, outwash, and lacustrine or lakebed. The alluvium of the bottom lands and the organic soils are mainly postglacial. In most places, and in varying amounts, the soils of Kendall County are covered by deposits of silt loam. This covering is mainly loess, but in many areas it contains glacial outwash. It ranges from 10 to 24 inches in depth in the Swygert-Bryce association to 40 to 50 inches in depth in the Plano-Elburn-St. Charles association (fig. 10).

Glacial till is the unstratified, unsorted material deposited directly by the glacier ice. It occurs as terminal and end moraines or as ground moraine. In Kendall County there are four areas (fig. 11), which are the Elburn Drift, a complex of glacial till and glacial outwash; the St. Charles Moraine, a weak and poorly defined moraine; the Marseilles Moraine, part of a broad system that consists of both terminal and ground moraines; and the Minooka Moraine, a well-defined terminal moraine that has a relatively flat crest and that is in the southeastern part of the county.

The glacial till in the county has the textures of silty clay loam, in which the Varna soils formed; silt loam or loam, in

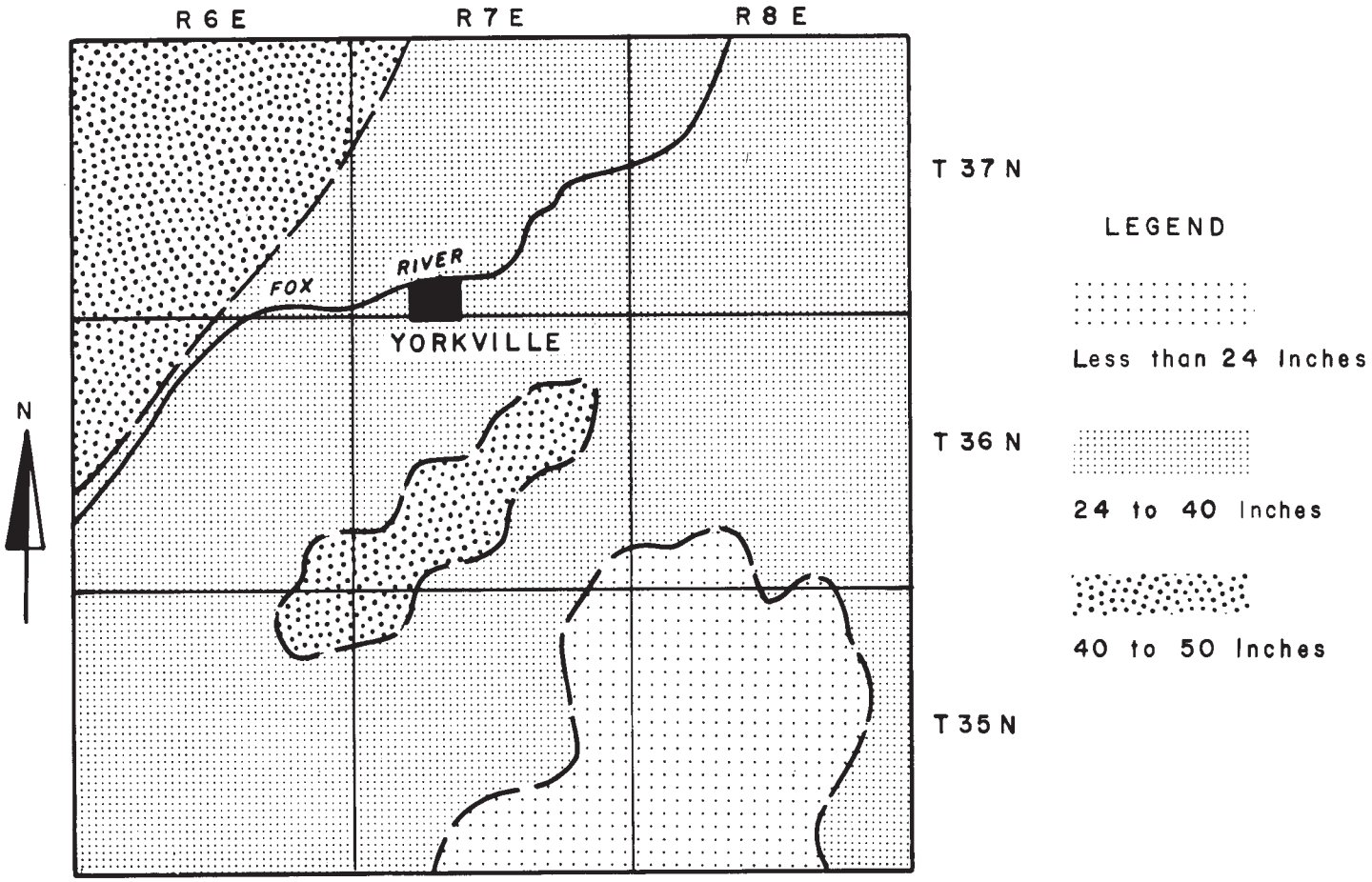

Figure 10.—**Thickness of silt loam and loess over glacial material.**

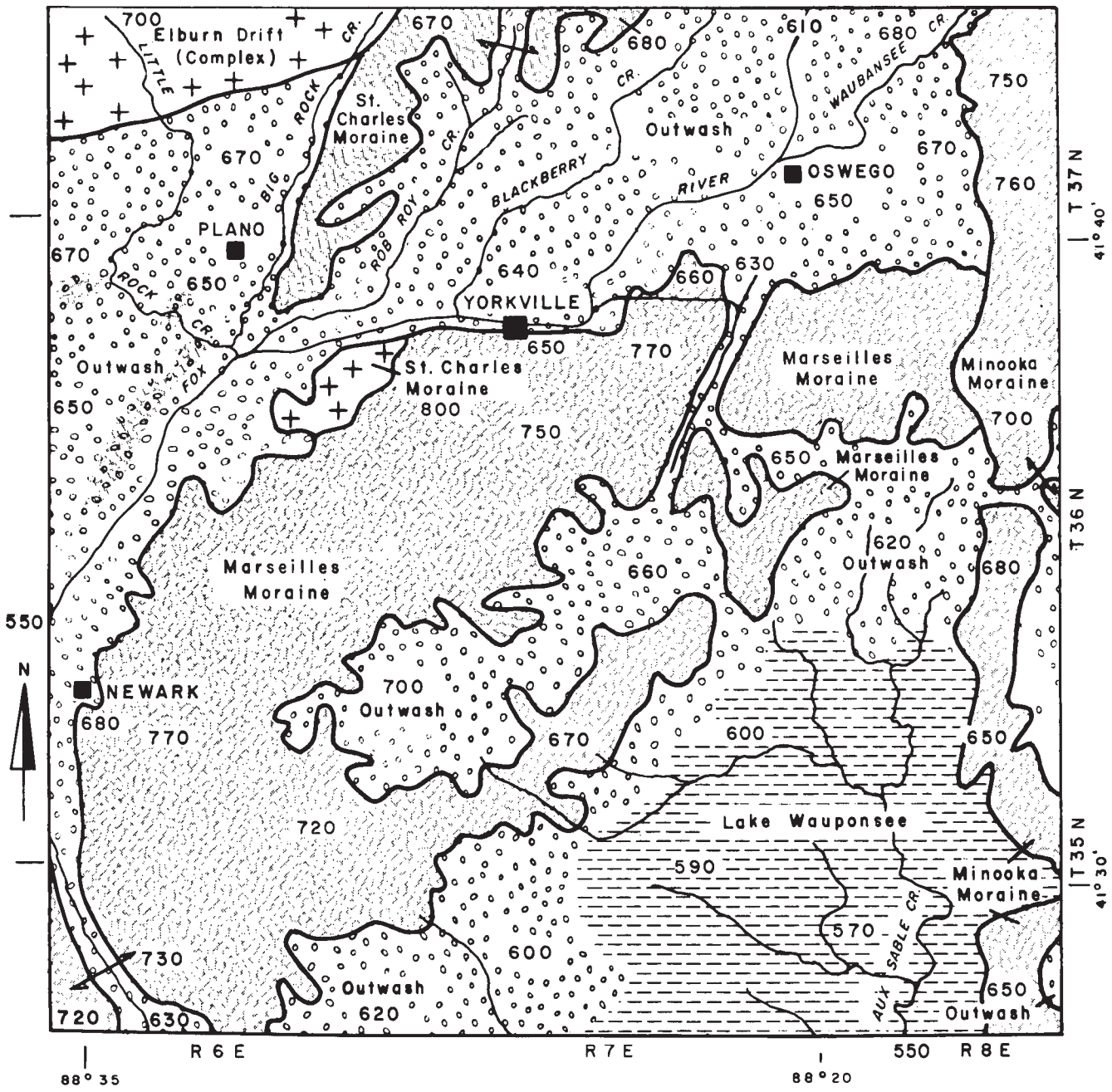

Figure 11.—**Glacial features of Kendall County.**

which the Saybrook and Strawn soils formed; and sandy loam, in which the Plano and St. Charles soils formed.

Glacial outwash is the stratified, sorted material deposited by melt water from the glacier. The outwash in the county has the textures of gravel and sand, in which the Lorenzo, Dresden, and Waupecan soils formed; silt and sand, in which the Proctor and Mundelein soils formed; and sand, in which the Sparta soils formed.

The lacustrine material, a form of glacial outwash, has the textures of silty clay loam, in which the Milford and Martinton soils formed; and silty clay and clay, in which the Bryce and Swygert soils formed.

The alluvium consists of sand, silt, clay, or other soil material that was deposited mainly on bottom lands by the floodwater from streams and rivers. The Sawmill, Millington, DuPage, and Landes soils formed in alluvium.

Organic material is partly decomposed and partly undecomposed plant remains that accumulated in swamps and marshes. Houghton and Lena soils formed in this material.

Loess is unstratified earthy material accumulated through wind action. The St. Charles soils formed mainly in this material. Loess has accumulated on moist soils in the county, but cannot be identified on soils of the Lorenzo and Hennepin series or on soils that formed in alluvium.

Climate

Climate affects the formation of soils through its influence on the weathering of parent material. In Kendall County it is favorable to the weathering of minerals, the formation of clay, and the movement of these materials downward in the soil profile. Except for the Bryce, Drummer, DuPage, Harpster, Houghton, Landes, Lena, Milford, Millington, Peotone, Sawmill, and other level, poorly drained soils in low areas and on bottom lands, soils of the county have a subsoil that is more clayey than the surface layer.

Plants and animals

Plants have had a greater effect than animals on the formation of soils in Kendall County. The native vegetation in the county consisted mostly of prairie grasses and forest. The soils that formed under grass have a dark-colored surface layer that is high in organic-matter content. Most of the forested areas were on slopes bordering stream valleys and in less sloping adjoining areas. In general, the forested areas are wider and more definite on the northern and eastern sides of the stream valleys because the streams acted as barriers against the prairie fires that often swept over the area before it was settled.

The soils that formed under forest vegetation have a lighter colored surface layer and contain less organic matter than the soils that formed under grass. A few soils, the Batavia, Dresden, Millbrook, and Virgil soils, formed along the prairie-forested border, where trees fairly recently had invaded the prairie areas. There the soils are moderately dark colored.

The soils on bottom lands probably had a cover of mixed prairie grass and forest. They are dark colored, mainly because they contain organic matter that was transported by water with inorganic sediment.

Earthworms and burrowing animals help keep soils open and porous. Bacteria and fungi hasten the decomposition of vegetation and thus release plant nutrients.

Man has greatly affected soil formation. He changed the vegetation by clearing the forests and plowing the prairies and then seeding them to crops. Water and wind have removed soil from cropped areas and have deposited it in other areas. Man has altered the natural condition of the soils by draining wet soils and swamp areas and by applying large amounts of lime and fertilizer. He has forced the beginning of a new cycle of soil formation in places where grading has destroyed soil profiles or filling has covered them.

Relief and drainage

In Kendall County, relief influences the formation of soils mainly through its effect on drainage. The slope of the soil affects the amount of runoff and, consequently, the degree of erosion and the amount of water that infiltrates and percolates through the profile. In areas where the soils formed in uniform, permeable parent material, such as silt loam, the natural drainage is closely associated with slope. The well drained and moderately well drained soils are in the more rolling areas, and the somewhat poorly drained and poorly drained soils are in nearly level or depressional areas. Kendall County has a high proportion of nearly level soils. Slopes in the county range from nearly level or less than 2 percent in soil associations 8 and 9 to steep or 30 to 45 percent in soil associations 2 and 4.

Time

The length of time necessary for a given soil to develop depends on the other factors of soil formation. Soils that form in parent material that is low in content of lime develop more rapidly and are more acid than soils that form in material that is high in content of lime. Some soils are leached of lime and other soluble minerals much more rapidly than other soils because they are more rapidly permeable. Soils develop more rapidly under forest than under prairie vegetation because grasses bring calcium and other bases from the subsoil up to the surface layer more efficiently than other plants. Soils generally develop more rapidly in a humid climate than a dry climate. On a stable landscape the soils generally are more strongly developed or have more distinct horizons as the time that they have been exposed to weathering processes increases.

Geologically, the soils of Kendall County are young. The last glaciation covered the county during the Woodfordian substage of the Wisconsinan glacial stage that, according to radiocarbon dates, took place 12,500 to 20,000 years ago (*11*). Along the valley of the Fox River, many of the soils formed in glacial outwash deposited 7,000 to 8,000 years ago.

Classification of the Soils

Soils are classified so that we can more easily remember their significant characteristics. Classification enables us to assemble knowledge about the soils, to see their relationship to one another and to the whole environment, and to develop principles that help us to understand their behavior and their response to manipulation. First through classification, and then through use of soil maps, we can apply our knowledge of soils to specific fields and other tracts of land. Table 11 shows the classification of each soil series in the country.

The narrow categories of classification, such as those used in detailed soil surveys, allow us to organize and apply knowledge about soils in managing farms, fields, and woodlands; in developing rural areas; in engineering work; and in many other ways. Soils are placed in broad classes to facilitate study and comparison in large areas, such as countries and continents.

The system of soil classification currently used was adopted

TABLE 11.—*Classification of soils*

Series	Family	Subgroup	Order
Barrington	Fine-silty, mixed, mesic	Typic Argiudolls	Mollisols.
Batavia	Fine-silty, mixed, mesic	Mollic Hapludalfs	Alfisols.
Brenton	Fine-silty, mixed, mesic	Aquic Argiudolls	Mollisols.
Bryce	Fine, mixed, mesic	Typic Haplaquolls	Mollisols.
Camden	Fine-silty, mixed, mesic	Typic Hapludalfs	Alfisols.
Del Rey	Fine, illitic, mesic	Aeric Ochraqualfs	Alfisols.
Dodge	Fine-silty, mixed, mesic	Typic Hapludalfs	Alfisols.
Dresden	Fine-loamy over sandy or sandy-skeletal, mixed, mesic	Mollic Hapludalfs	Alfisols.
Drummer	Fine-silty, mixed, mesic	Typic Haplaquolls	Mollisols.
DuPage	Fine-loamy, mixed, mesic	Cumulic Hapludolls	Mollisols.
Elburn	Fine-silty, mixed, mesic	Aquic Argiudolls	Mollisols.
Fox	Fine-loamy over sandy or sandy-skeletal, mixed, mesic	Typic Hapludalfs	Alfisols.
Harpster	Fine-silty, mixed, mesic	Typic Calciaquolls	Mollisols.
Hennepin	Fine-loamy, mixed, mesic	Typic Eutrochrepts	Inceptisols.
Houghton	Euic, mesic	Typic Medisaprists	Histosols.
Kendall	Fine-silty, mixed, mesic	Aeric Ochraqualfs	Alfisols.
Knight	Fine-silty, mixed, mesic	Argiaquic Argialbolls	Mollisols.
Landes	Coarse-loamy, mixed, mesic	Fluventic Hapludolls	Mollisols.
La Rose	Fine-loamy, mixed, mesic	Typic Argiudolls	Mollisols.
Lena	Euic, mesic	Typic Medisaprists	Histosols.
Lisbon	Fine-silty, mixed, mesic	Aquic Argiudolls	Mollisols.
Lorenzo	Fine-loamy over sandy or sandy-skeletal, mixed, mesic	Typic Argiudolls	Mollisols.
Martinton	Fine, illitic, mesic	Aquic Argiudolls	Mollisols.
Milford	Fine, mixed, mesic	Typic Haplaquolls	Mollisols.
Millbrook	Fine-silty, mixed, mesic	Udollic Ochraqualfs	Alfisols.
Millington	Fine-loamy, mixed, calcareous, mesic	Cumulic Haplaquolls	Mollisols.
Mundelein	Fine-silty, mixed, mesic	Aquic Argiudolls	Mollisols.
Nappanee	Fine, illitic, mesic	Aeric Ochraqualfs	Alfisols.
Peotone	Fine, montmorillonitic, mesic	Cumulic Haplaquolls	Mollisols.
Plano	Fine-silty, mixed, mesic	Typic Argiudolls	Mollisols.
Plattville	Fine-loamy, mixed, mesic	Typic Argiudolls	Mollisols.
Proctor	Fine-silty, mixed, mesic	Typic Argiudolls	Mollisols.
Ripon	Fine-silty, mixed, mesic	Typic Argiudolls	Mollisols.
Rush	Fine-silty, mixed, mesic	Typic Hapludalfs	Alfisols.
St. Charles	Fine-silty, mixed, mesic	Typic Hapludalfs	Alfisols.
Sawmill	Fine-silty, mixed, mesic	Cumulic Haplaquolls	Mollisols.
Saybrook	Fine-silty, mixed, mesic	Typic Argiudolls	Mollisols.
Sparta	Sandy, mixed, mesic	Entic Hapludolls	Mollisols.
Strawn	Fine-loamy, mixed, mesic	Typic Hapludalfs	Alfisols.
Swygert	Fine, illitic, mesic	Aquic Argiudolls	Mollisols.
Thorp	Fine-silty, mixed, mesic (fine)	Argiaquic Argialbolls	Mollisols.
Varna	Fine, illitic, mesic	Typic Argiudolls	Mollisols.
Virgil	Fine-silty, mixed, mesic	Udollic Ochraqualfs	Alfisols.
Waupecan	Fine-silty, mixed, mesic	Typic Argiudolls	Mollisols.

by the National Cooperative Soil Survey in 1965. Because this system is under continual study, readers interested in developments of the current system should search the latest literature (*7*).

The current system of classification has six categories. Beginning with the broadest, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. In this system the criteria used as a basis for classification are soil properties that are observable and measurable. The properties are chosen, however, so that soils of similar genesis, or mode of origin, are grouped. In table 11, the soil series of Kendall County are placed in six categories of the current system. Classes of the current system are briefly defined in the following paragraphs.

Order.—Ten soil orders are recognized. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. The two exceptions to this are the Entisols and Histosols, which occur in many different climates. The four orders represented in Kendall County are Inceptisols, Mollisols, Alfisols, and Histosols.

Inceptisols generally develop on young, but not recent, land surfaces. Mollisols generally develop under grass vegetation. They have a thick, dark-colored surface layer, called the mollic epipedon. Alfisols have a clay-enriched B horizon that is high in base saturation. Histosols are organic soils that do not have genetic horizons.

Suborder.—Each order is divided into suborders, primarily on the basis of characteristics that seem to produce classes that have the greatest genetic similarity. The soil properties used to separate suborders are mainly those that reflect either the presence or absence of waterlogging, or soil differences that result from the climate or vegetation. The climatic range of the suborder is narrower than that of the order. The names of suborders have two syllables. The last syllable indicates the order.

Great group.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of soil horizons and features. The horizons used to make separations are those in which clay, carbonates, and other constituents have accumulated or have been removed and those that have pans that interfere with the growth of roots, movement of water, or both. Some features used are soil acidity, soil climate, soil composition, and soil color. The names of great groups have three or four syllables and are

made by adding a prefix to the name of the suborder. An example is Haplaquoll (*Hapl*, meaning simple horizons; *aqu*, for wetness or water; and *oll*, from Mollisols).

Subgroup.—Great groups are divided into subgroups, one that represents the central (typic) segment of the group and others, called intergrades, that have properties of the group and also one or more properties of another great group, suborder, or order. Other subgroups may have soil properties unlike those of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives in front of the name of the great group. An example is Typic Haplaquolls (a typical Haplaquoll).

Family.—Soil families are established within a subgroup mainly on the basis of properties important to the growth of plants or to the behavior of soils when used for engineering. Among the properties considered are texture, mineralogy, reaction, soil temperature, permeability, soil depth, and consistence. A family name consists of a series of adjectives preceding the subgroup name. The adjectives are the class names for texture, mineralogy, and so on, that are used to differentiate families.

Series.—The series is a group of soils that have major horizons that, except for texture of the surface layer, are similar in important characteristics and in arrangement in the profile.

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Glossary

Acidity. See Reaction, soil.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The ratings are: *very high*, 12 inches or more; *high*, 9 to 12 inches; *moderate*, 6 to 9 inches; *low*, 3 to 6 inches; and *very low*, less than 3 inches.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of clay on the surface of a soil aggregate. Synonyms: clay coating.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard and brittle; little affected by moistening.

Depth, soil. Thickness of the soil over a specified layer, generally one that does not permit the growth of roots. The depths are: *deep*, 36 or more inches; *moderately deep*, 20 to 36 inches; *shallow*, 10 to 20 inches; and *very shallow*, less than 10 inches.

Drainage class (natural). Drainage that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.
Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.
Well-drained soils are nearly free from mottling and are commonly of intermediate texture.
Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A horizon and upper part of the B horizon and mottling in the lower part of the B horizon and in the C horizon.
Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.
Poorly drained soils are wet for long periods. They are light gray and generally mottled from the surface downward, but some have few or no mottles.
Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Diversion, or diversion terrace. A ridge of earth, generally a terrace, that is built to divert runoff from its natural course and, thus, to protect areas downslope from the effects of such runoff.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Fertility, soil. The quality of a soil that enables it to provide compounds, in adequate amounts and in proper balance, for the growth of specified plants, when other growth factors such as light, moisture, temperature, and the physical condition of the soil are favorable.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residuse.
A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of

humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition. In words, the amounts of organic-matter content by percent of weight are rated as follows: *low,* below 2; *moderate,* 2 to 4; and *high,* more than 4.

Percolation. The downward movement of water through the soil.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Sand. As a soil separate, individual rock or mineral fragments that range from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but the sand may be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace. An embankment or ridge constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it soaks into the soil or flows slowly to a prepared outlet without harm. Some terraces are farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs. Other information is given in tables as follows:

Acreage and extent, table 3, page 7.
Predicted yields, table 4, page 42.
Windbreaks, table 5, page 44.
Recreation, table 6, page 46.
Wildlife groups, table 7, page 52.
Engineering uses of the soils, tables 8, 9, and 10, pages 54 to 71.

Map symbol	Mapping unit	Described on page	Management group		Tree planting group	Wildlife group
			Symbol	Page	Number	Number
24A	Dodge silt loam, 0 to 2 percent slopes	12	I-1	38	1	1
24B	Dodge silt loam, 2 to 4 percent slopes	13	IIe-1	39	1	1
24C2	Dodge silt loam, 4 to 7 percent slopes, eroded	13	IIe-1	39	1	5
25F	Hennepin silt loam, 15 to 30 percent slopes	17	VI	41	1	6
25G	Hennepin silt loam, 30 to 45 percent slopes	17	VII	41	1	6
59	Lisbon silt loam	21	I-2	39	2	2
60B2	La Rose silt loam, 2 to 4 percent slopes, eroded	19	IIe-1	39	1	1
60C2	La Rose silt loam, 4 to 7 percent slopes, eroded	20	IIe-1	39	1	5
60C3	La Rose soils, 4 to 7 percent slopes, severely eroded	20	IIIe-1	40	1	5
60D3	La Rose soils, 7 to 12 percent slopes, severely eroded	20	IVe-1	41	1	6
67	Harpster silty clay loam	16	IIw-1	39	4	3
69	Milford silty clay loam	23	IIw-1	39	4	3
R69	Milford silty clay loam, bedrock substratum	23	IIw-1	39	4	3
82	Millington silt loam	24	IIw-2	39	5	4
88C	Sparta loamy fine sand, 3 to 10 percent slopes	33	IIIs-1	41	1	5
91A	Swygert silty clay loam, 0 to 2 percent slopes	34	IIw-4	40	3	2
91B	Swygert silty clay loam, 2 to 4 percent slopes	34	IIe-2	39	3	2
91C2	Swygert silty clay loam, 3 to 7 percent slopes, eroded	34	IIIe-2	40	3	5
103	Houghton muck	17	IIIw-1	40	6	4
104	Virgil silt loam	36	I-2	39	2	2
105A	Batavia silt loam, 0 to 2 percent slopes	9	I-1	38	1	1
105B	Batavia silt loam, 2 to 4 percent slopes	9	IIe-1	39	1	1
107	Sawmill silty clay loam	31	IIw-2	39	5	4
134B	Camden silt loam, 1 to 4 percent slopes	11	IIe-1	39	1	1
134C2	Camden silt loam, 4 to 7 percent slopes, eroded	11	IIe-1	39	1	5
134D2	Camden silt loam, 7 to 12 percent slopes, eroded	11	IIIe-1	40	1	5
145A	Saybrook silt loam, 0 to 2 percent slopes	32	I-1	38	1	1
145B	Saybrook silt loam, 2 to 4 percent slopes	32	IIe-1	39	1	1
145B2	Saybrook silt loam, 2 to 4 percent slopes, eroded	32	IIe-1	39	1	1
145C2	Saybrook silt loam, 4 to 7 percent slopes, eroded	32	IIe-1	39	1	5
148A	Proctor silt loam, 0 to 2 percent slopes	28	I-1	38	1	1
148B	Proctor silt loam, 2 to 4 percent slopes	28	IIe-1	39	1	1
148C2	Proctor silt loam, 4 to 7 percent slopes, eroded	28	IIe-1	39	1	5
149	Brenton silt loam	10	I-2	39	2	2
R149	Brenton silt loam, bedrock substratum	10	I-2	39	2	2
152	Drummer silty clay loam	14	IIw-1	39	4	3
189A	Martinton silt loam, 0 to 2 percent slopes	22	IIw-4	40	3	2
189B	Martinton silt loam, 2 to 4 percent slopes	23	IIe-2	39	3	2
191	Knight silt loam	19	IIw-1	39	5	4
192	Del Rey silt loam	12	IIw-4	40	3	2
198	Elburn silt loam	15	I-2	39	2	2
199A	Plano silt loam, 0 to 2 percent slopes	27	I-1	38	1	1
199B	Plano silt loam, 2 to 4 percent slopes	27	IIe-1	39	1	1
199C2	Plano silt loam, 4 to 7 percent slopes, eroded	27	IIe-1	39	1	5
206	Thorp silt loam	35	IIw-1	39	5	4
210	Lena muck	20	IIIw-1	40	6	4
219	Millbrook silt loam	24	I-2	39	2	2
223B	Varna silt loam, 1 to 4 percent slopes	35	IIe-2	39	1	1
223C2	Varna silt loam, 4 to 7 percent slopes, eroded	36	IIIe-2	40	1	5
223D3	Varna soils, 7 to 15 percent slopes, severely eroded	36	IVe-1	41	1	6

GUIDE TO MAPPING UNITS--Continued

Map symbol	Mapping unit	Described on page	Management group		Tree planting group	Wildlife group
			Symbol	Page	Number	Number
224C	Strawn silt loam, 4 to 7 percent slopes	33	IIe-1	39	1	5
224C2	Strawn silt loam, 4 to 7 percent slopes, eroded	33	IIe-1	39	1	5
224C3	Strawn soils, 4 to 7 percent slopes, severely eroded	33	IIIe-1	40	1	5
224D2	Strawn silt loam, 7 to 15 percent slopes, eroded	33	IIIe-1	40	1	5
224D3	Strawn soils, 7 to 12 percent slopes, severely eroded	34	IVe-1	41	1	6
224F	Strawn silt loam, 15 to 30 percent slopes	33	VI	41	1	6
228A	Nappanee silt loam, 0 to 2 percent slopes	26	IIw-4	40	3	2
228B	Nappanee silt loam, 2 to 4 percent slopes	26	IIIe-2	40	3	2
235	Bryce silty clay	10	IIw-3	39	4	3
240A	Plattville silt loam, 0 to 2 percent slopes	28	I-1	38	1	1
240B	Plattville silt loam, 2 to 4 percent slopes	28	IIe-1	39	1	1
242	Kendall silt loam	18	I-2	39	2	2
243A	St. Charles silt loam, 0 to 2 percent slopes	30	I-1	38	1	1
243B	St. Charles silt loam, 2 to 4 percent slopes	31	IIe-1	39	1	1
243C2	St. Charles silt loam, 4 to 7 percent slopes, eroded	31	IIe-1	39	1	5
304	Landes fine sandy loam	19	IIIs-1	41	5	4
318C	Lorenzo loam, 4 to 7 percent slopes	22	IIIs-1	41	1	5
318D2	Lorenzo loam, 7 to 18 percent slopes, eroded	22	IVe-1	41	1	5
318F	Lorenzo loam, 18 to 40 percent slopes	22	VII	41	1	6
321	DuPage loam	14	I-1	38	5	4
324B	Ripon silt loam, 1 to 4 percent slopes	29	IIs-1	40	1	1
324C2	Ripon silt loam, 4 to 7 percent slopes, eroded	29	IIIs-1	41	1	5
325A	Dresden silt loam, 0 to 2 percent slopes	13	IIs-1	40	1	1
325B	Dresden silt loam, 2 to 4 percent slopes	13	IIs-1	40	1	1
327B	Fox silt loam, 1 to 4 percent slopes	16	IIs-1	40	1	1
327C2	Fox silt loam, 4 to 7 percent slopes, eroded	16	IIIs-1	41	1	5
330	Peotone silty clay loam	26	IIw-3	39	5	4
369A	Waupecan silt loam, 0 to 2 percent slopes	37	I-1	38	1	1
369B	Waupecan silt loam, 2 to 4 percent slopes	37	IIe-1	39	1	1
442	Mundelein silt loam	25	I-2	39	2	2
443A	Barrington silt loam, 0 to 2 percent slopes	8	I-1	38	1	1
443B	Barrington silt loam, 2 to 4 percent slopes	8	IIe-1	39	1	1
443C2	Barrington silt loam, 4 to 7 percent slopes, eroded	8	IIe-1	39	1	5
791A	Rush silt loam, 0 to 2 percent slopes	30	I-1	38	1	1
791B	Rush silt loam, 2 to 4 percent slopes	30	IIe-1	39	1	1
C.F.	Cut and fill land	11	------	--	---	---
G.P.	Gravel pits	16	------	--	---	---

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U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ILLINOIS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

KENDALL COUNTY, ILLINOIS

Scale 1:126,720

1 0 1 2 3 4 Miles

N

SOIL ASSOCIATIONS

1 — Plano-Elburn-St. Charles association: Nearly level to gently sloping, well drained to somewhat poorly drained soils that formed in silt loam material and the underlying sandy loam glacial drift

2 — Millington-Lorenzo-Fox association: Nearly level, poorly drained soils that formed in silt loam sediment and gently sloping to very steep, well-drained soils that formed in dominantly sandy loam to silty clay loam material and the underlying sand and gravel

3 — Waupecan-Dresden-Brenton association: Nearly level to gently sloping, well drained to somewhat poorly drained soils that formed in silt loam and loam material and the underlying sand and gravel

4 — Strawn-Dodge association: Gently sloping to steep, well-drained soils that formed in silt loam material and the underlying loam and silt loam glacial till

5 — Saybrook-Drummer-La Rose association: Well drained to poorly drained, nearly level to strongly sloping soils that formed in silt loam material and the underlying silt loam to loam glacial till

6 — Drummer-Mundelein-Brenton association: Nearly level, poorly drained and somewhat poorly drained soils that formed in silt loam material and the underlying glacial outwash

7 — Swygert-Bryce-Martinton association: Nearly level, somewhat poorly drained and poorly drained soils that formed in silty clay and silty clay loam lakebed sediments

Compiled 1976

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SECTIONALIZED TOWNSHIP

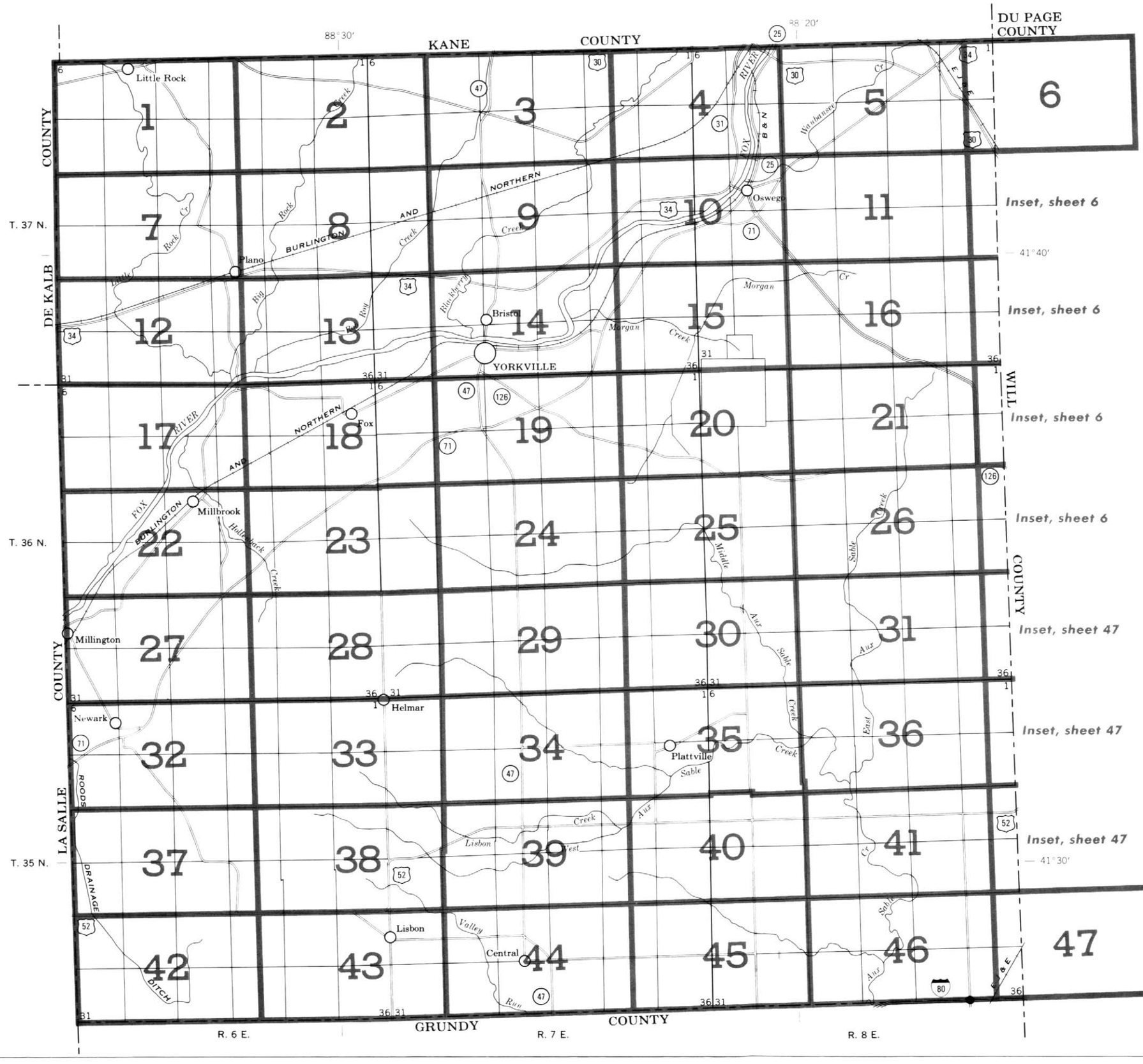
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
KENDALL COUNTY, ILLINOIS

Scale 1:126,720

1 0 1 2 3 4 Miles

N



SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

SOIL LEGEND

Each soil symbol consists of a combination of two or three numerals representing a series. A capital letter representing the class of slope and a number indicating whether the soil is eroded or severely eroded may also be present. The letter R may precede the soil number to indicate bedrock substratum. Two capital letters indicate a miscellaneous land type.

SYMBOL	NAME
443A	Barrington silt loam, 0 to 2 percent slopes
443B	Barrington silt loam, 2 to 4 percent slopes
443C2	Barrington silt loam, 4 to 7 percent slopes, eroded
105A	Batavia silt loam, 0 to 2 percent slopes
105B	Batavia silt loam, 2 to 4 percent slopes
149	Brenton silt loam
R149	Brenton silt loam, bedrock substratum
235	Bryce silty clay
134B	Camden silt loam, 1 to 4 percent slopes
134C2	Camden silt loam, 4 to 7 percent slopes, eroded
134D2	Camden silt loam, 7 to 12 percent slopes, eroded
C.F.	Cut and fill land
192	Del Rey silt loam
24A	Dodge silt loam, 0 to 2 percent slopes
24B	Dodge silt loam, 2 to 4 percent slopes
24C2	Dodge silt loam, 4 to 7 percent slopes, eroded
325A	Dresden silt loam, 0 to 2 percent slopes
325B	Dresden silt loam, 2 to 4 percent slopes
152	Drummer silty clay loam
321	DuPage loam
198	Elburn silt loam
327B	Fox silt loam, 1 to 4 percent slopes
327C2	Fox silt loam, 4 to 7 percent slopes, eroded
G.P.	Gravel pits
67	Harpster silty clay loam
25F	Hennepin silt loam, 15 to 30 percent slopes
25G	Hennepin silt loam, 30 to 45 percent slopes
103	Houghton muck

SYMBOL	NAME
242	Kendall silt loam
191	Knight silt loam
304	Landes fine sandy loam
60B2	La Rose silt loam, 2 to 4 percent slopes, eroded
60C2	La Rose silt loam, 4 to 7 percent slopes, eroded
60C3	La Rose soils, 4 to 7 percent slopes, severely eroded
60D3	La Rose soils, 7 to 12 percent slopes, severely eroded
210	Lena muck
59	Lisbon silt loam
318C	Lorenzo loam, 4 to 7 percent slopes
318D2	Lorenzo loam, 7 to 18 percent slopes, eroded
318F	Lorenzo loam, 18 to 40 percent slopes
189A	Martinton silt loam, 0 to 2 percent slopes
189B	Martinton silt loam, 2 to 4 percent slopes
69	Milford silty clay loam
R69	Milford silty clay loam, bedrock substratum
219	Millbrook silt loam
82	Millington silt loam
442	Mundelein silt loam
228A	Nappanee silt loam, 0 to 2 percent slopes
228B	Nappanee silt loam, 2 to 4 percent slopes
330	Peotone silty clay loam
199A	Plano silt loam, 0 to 2 percent slopes
199B	Plano silt loam, 2 to 4 percent slopes
199C2	Plano silt loam, 4 to 7 percent slopes, eroded
240A	Plattville silt loam, 0 to 2 percent slopes
240B	Plattville silt loam, 2 to 4 percent slopes
148A	Proctor silt loam, 0 to 2 percent slopes
148B	Proctor silt loam, 2 to 4 percent slopes
148C2	Proctor silt loam, 4 to 7 percent slopes, eroded

SYMBOL	NAME
324B	Ripon silt loam, 1 to 4 percent slopes
324C2	Ripon silt loam, 4 to 7 percent slopes, eroded
791A	Rush silt loam, 0 to 2 percent slopes
791B	Rush silt loam, 2 to 4 percent slopes
243A	St. Charles silt loam, 0 to 2 percent slopes
243B	St. Charles silt loam, 2 to 4 percent slopes
243C2	St. Charles silt loam, 4 to 7 percent slopes, eroded
107	Sawmill silty clay loam
145A	Saybrook silt loam, 0 to 2 percent slopes
145B	Saybrook silt loam, 2 to 4 percent slopes
145B2	Saybrook silt loam, 2 to 4 percent slopes, eroded
145C2	Saybrook silt loam, 4 to 7 percent slopes, eroded
88C	Sparta loamy fine sand, 3 to 10 percent slopes
224C	Strawn silt loam, 4 to 7 percent slopes
224C2	Strawn silt loam, 4 to 7 percent slopes, eroded
224D2	Strawn silt loam, 7 to 15 percent slopes, eroded
224F	Strawn silt loam, 15 to 30 percent slopes
224C3	Strawn soils, 4 to 7 percent slopes, severely eroded
224D3	Strawn soils, 7 to 12 percent slopes, severely eroded
91A	Swygert silty clay loam, 0 to 2 percent slopes
91B	Swygert silty clay loam, 2 to 4 percent slopes
91C2	Swygert silty clay loam, 3 to 7 percent slopes, eroded
206	Thorp silt loam
223B	Varna silt loam, 1 to 4 percent slopes
223C2	Varna silt loam, 4 to 7 percent slopes, eroded
223D3	Varna soils, 7 to 15 percent slopes, severely eroded
104	Virgil silt loam
369A	Waupecan silt loam, 0 to 2 percent slopes
369B	Waupecan silt loam, 2 to 4 percent slopes

KENDALL COUNTY, ILLINOIS

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline & neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Davis Airstrip; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNERS (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEMS & DESIGNATIONS

- Interstate (79)
- Federal (410)
- State (52)
- County, farm or ranch (378)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or small (water)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (GAS)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water, w)
- Intermittent (int, i)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (CeA, FoB2)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE SITE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Muck or peat areas 3 acres or less
- Calcareous areas 3 acres or less
- Gray areas 3 acres or less
- Mine dump (M.D.)

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS NO. 1

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 2

KANE COUNTY

R. 6 E. | R. 7 E.

T. 37 N.

460 000 FEET

1 840 000 FEET

1 830 000 FEET

445 000 FEET

(Joins sheet 1)

(Joins sheet 3)

(Joins sheet 8)

Rock Creek

Fox

G.P.

water

Scale 1:15 840

1 Mile

5 000 Feet

KENDALL COUNTY, ILLINOIS NO. 2

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Coordinate grid ticks and land division corners, if shown, are approximately positioned

KENDALL COUNTY, ILLINOIS NO. 3

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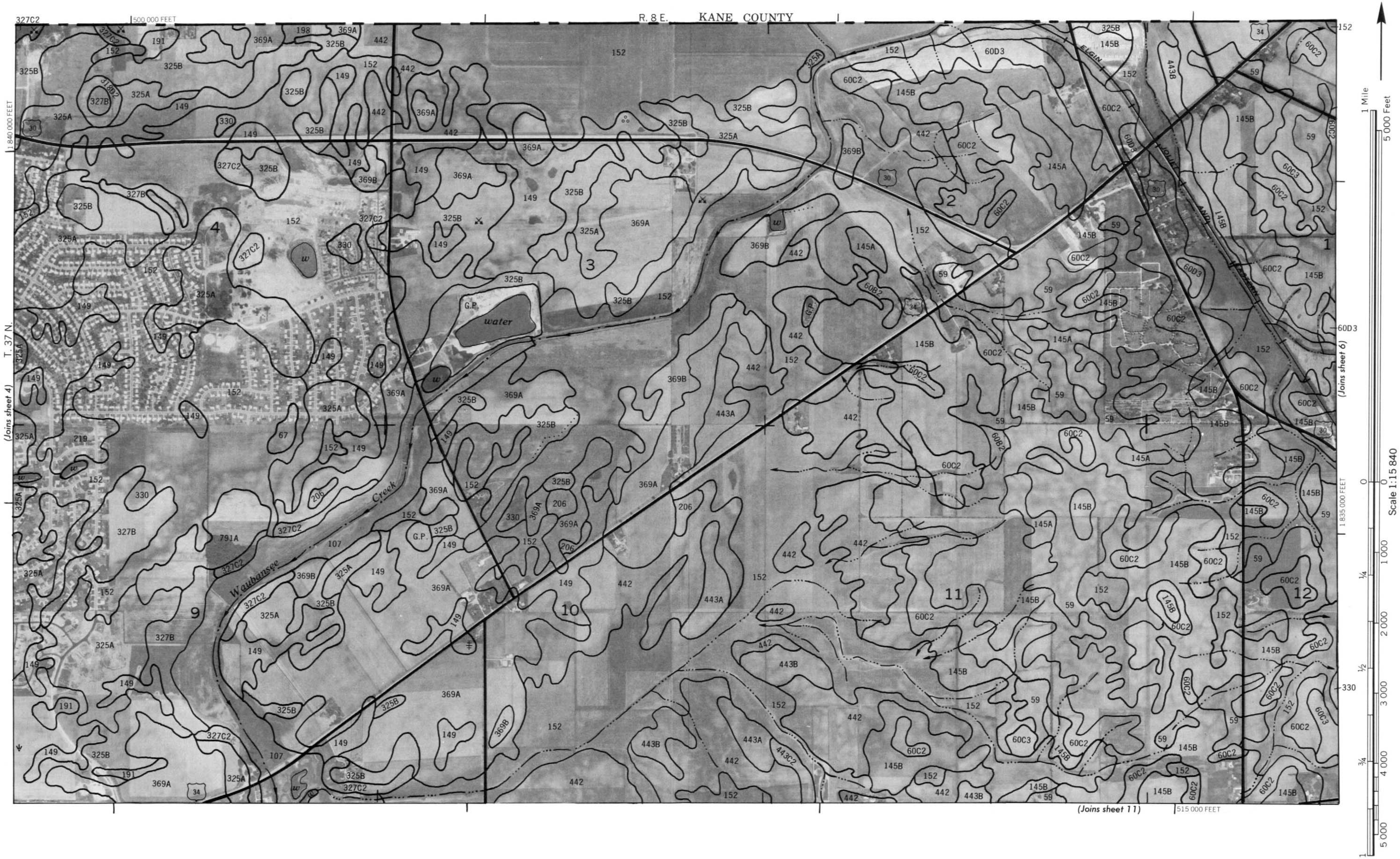
KENDALL COUNTY, ILLINOIS — SHEET NUMBER 4

KENDALL COUNTY, ILLINOIS NO. 4

This soil is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

5



This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned

KENDALL COUNTY, ILLINOIS NO. 5

6

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

0 1 000 2 000 3 000 4 000 5 000

R. 8 E. KANE COUNTY 519 000 FEET

1 840 000 FEET

T. 37 N.

(Joins sheet 5)

1 835 000 FEET

WILL COUNTY

ELGIN

JOLIET

EASTERN

518 000 FEET (Joins inset A)

1000 AND 5000-FOOT GRID TICKS

INSET A

R. 8 E. (Joins sheet 6) 519 000 FEET

1 830 000 FEET

T. 37 N.

(Joins sheet 11)

1 825 000 FEET

WILL COUNTY

518 000 FEET (Joins inset A A)

1000 AND 5000-FOOT GRID TICKS

INSET A A

R. 8 E. (Joins inset A, 520 000 FEET

1 820 000 FEET

T. 37 N.

(Joins sheet 16)

1 810 000 FEET

WILL COUNTY

518 000 FEET (Joins inset B)

2000 AND 5000-FOOT GRID TICKS

INSET B

(Joins inset A A, 520 000 FEET R. 8 E.

1 805 000 FEET

T. 37 N.

(Joins sheet 21)

T. 36 N.

1 800 000 FEET

WILL COUNTY

(Joins inset BB) 519 000 FEET

1000 AND 5000-FOOT GRID TICKS

INSET BB

(Joins inset B, 520 000 FEET R. 8 E.

1 795 000 FEET

T. 37 N.

(Joins sheet 26)

T. 36 N.

1 790 000 FEET

WILL COUNTY

519 000 FEET (Joins inset C, sheet 47)

1000 AND 5000-FOOT GRID TICKS

KENDALL COUNTY, ILLINOIS NO. 6

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Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS NO. 7

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Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 8

N

Scale 1:15 840

1 Mile

5 000 Feet

0 — 1 000 — 2 000 — 3 000 — 4 000 — 5 000

0 — ¼ — ½ — ¾ — 1

KENDALL COUNTY, ILLINOIS NO. 8

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 9

KENDALL COUNTY, ILLINOIS NO. 9

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture. Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned

9

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 10

KENDALL COUNTY, ILLINOIS NO. 10

N

KENDALL COUNTY, ILLINOIS NO. 11

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 12

12

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

199A | (Joins sheet 7) | R. 6 E. | 440 000 FEET

PLANO

NORTHERN BURLINGTON

Little Rock Creek

Rock Creek

Fox River

water

C.F.

G.P.

25F 25G 134B 134C2 134D2 243B 243C2 243A 199A 199B 199C2 105A 105B 104 191 198 206 304 107 103 330 321 242 148B 134B 82

29 28 27 30 31 32 33 34

COUNTY

DEKALB

T. 37 N. | 1 815 000 FEET

1 810 000 FEET

430 000 FEET | (Joins sheet 17)

(Joins sheet 13)

KENDALL COUNTY, ILLINOIS NO. 12

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 13

13

KENDALL COUNTY, ILLINOIS NO. 13

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 Mile

5 000 Feet

Scale 1:15 840

445 000 FEET

1 815 000 FEET

1 810 000 FEET

1 460 000 FEET

R. 6 E.

R. 7 E.

T. 37 N.

(Joins sheet 8)

(Joins sheet 12)

(Joins sheet 14)

(Joins sheet 18)

PLANO

Rock Creek

Big Rou Creek

Rob Roy Creek

FOX RIVER

NORTHERN ILLINOIS

BURLINGTON NORTHERN

water

G.P.

27 26 25 30 34 35 36 31

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 14

(14)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 9)

R. 7 E.

480 000 FEET

1 820 000 FEET

(Joins sheet 13)

1 810 000 FEET

465 000 FEET

(Joins sheet 19)

(Joins sheet 15)

T. 37 N.

YORKVILLE
(county seat)

FOX RIVER

BURLINGTON NORTHERN

Blackberry Creek

Morgan Creek

water

G.P.

C.F.

28

29

27

26

33

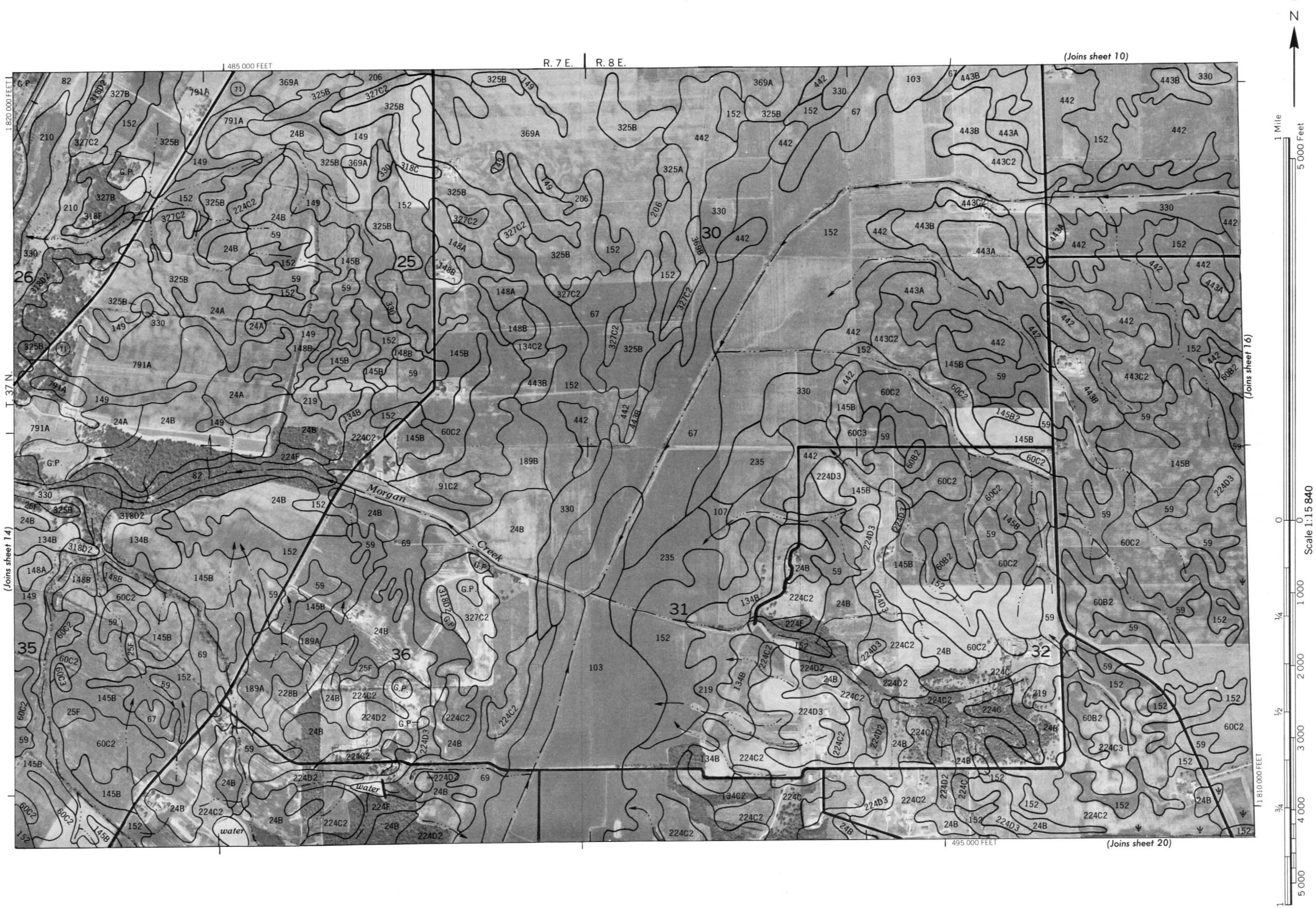
34

32

35

KENDALL COUNTY, ILLINOIS NO. 14

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned



KENDALL COUNTY, ILLINOIS NO. 15

This map is compiled on 1971 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

16

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

(Joins sheet 11)

R. 8 E.

515 000 FEET

1 820 000 FEET

T. 37 N.

(Joins inset AA, sheet 6)

1 810 000 FEET

500 000 FEET

(Joins sheet 21)

(Joins sheet 15)

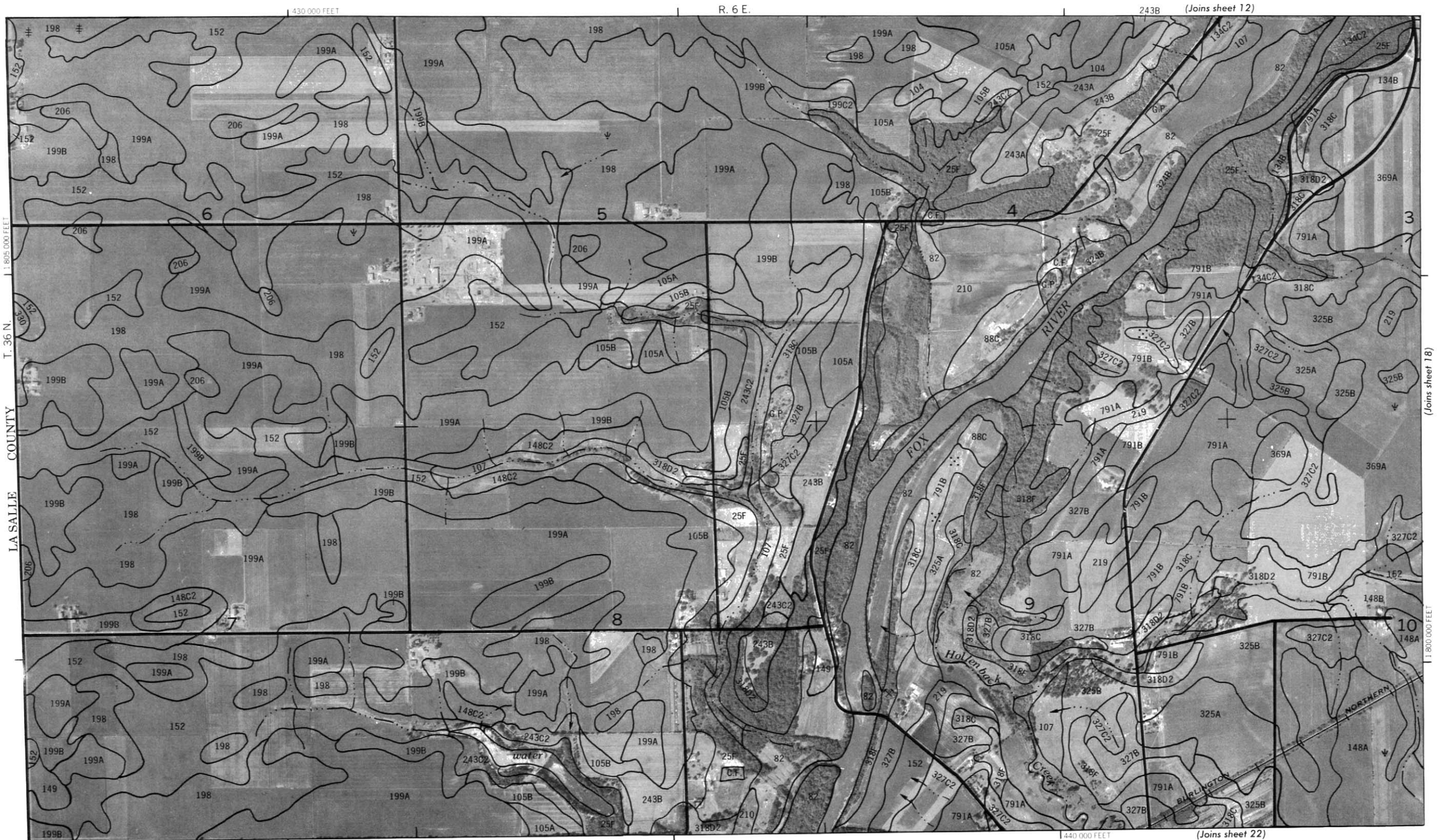
28 27 26 25 33 34 35 36

KENDALL COUNTY, ILLINOIS NO. 16

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 17

17

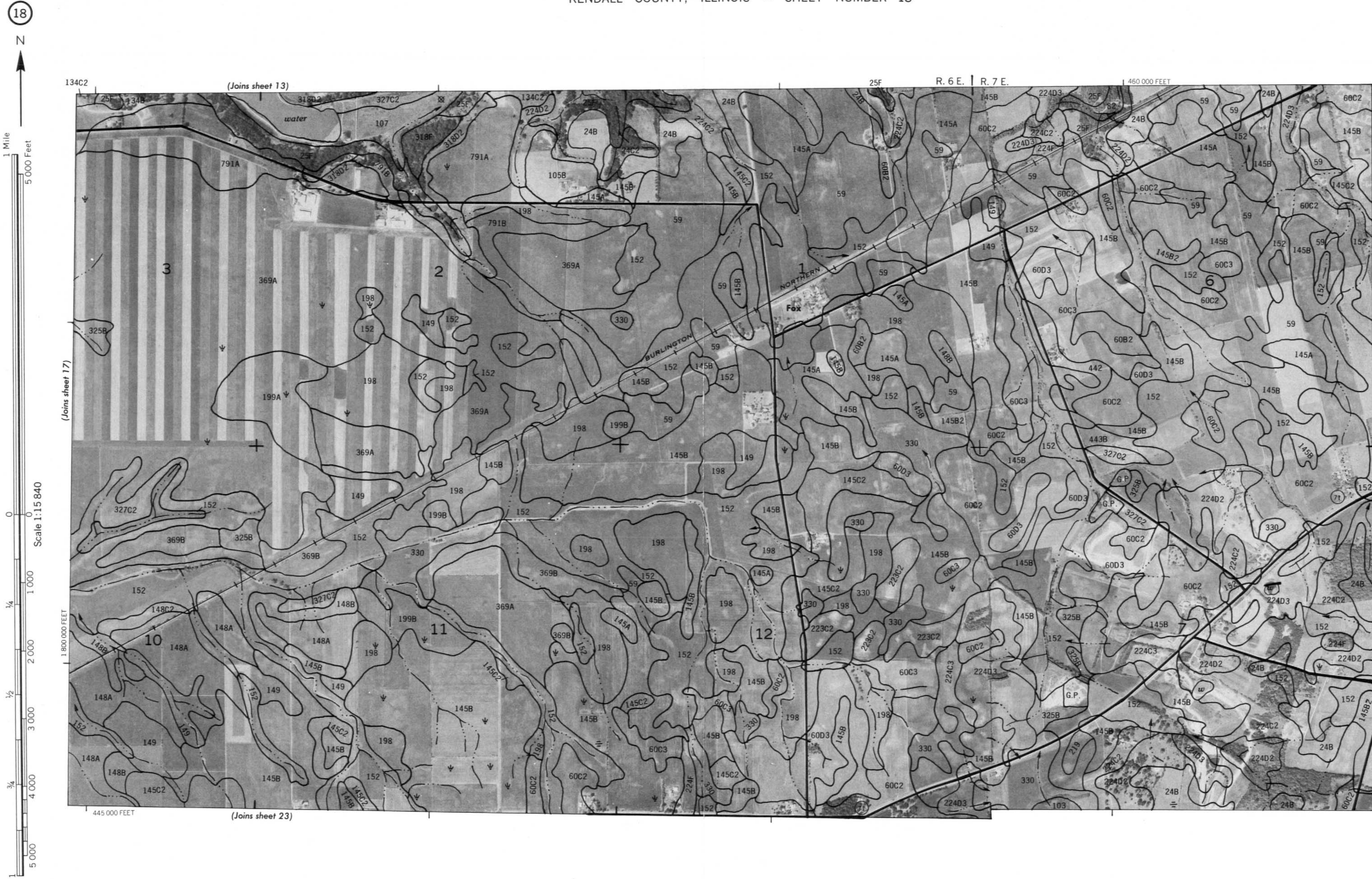
N



1 Mile
5 000 Feet

Scale 1:15 840

KENDALL COUNTY, ILLINOIS NO. 17



KENDALL COUNTY, ILLINOIS NO. 18

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 19

19

KENDALL COUNTY, ILLINOIS NO. 19

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

R. 7 E.

465 000 FEET

1 805 000 FEET

T. 36 N.

(Joins sheet 14)

(Joins sheet 18)

(Joins sheet 20)

(Joins sheet 24)

480 000 FEET

1 800 000 FEET

N

1 Mile

5 000 Feet

Scale 1:15 840

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 20

20

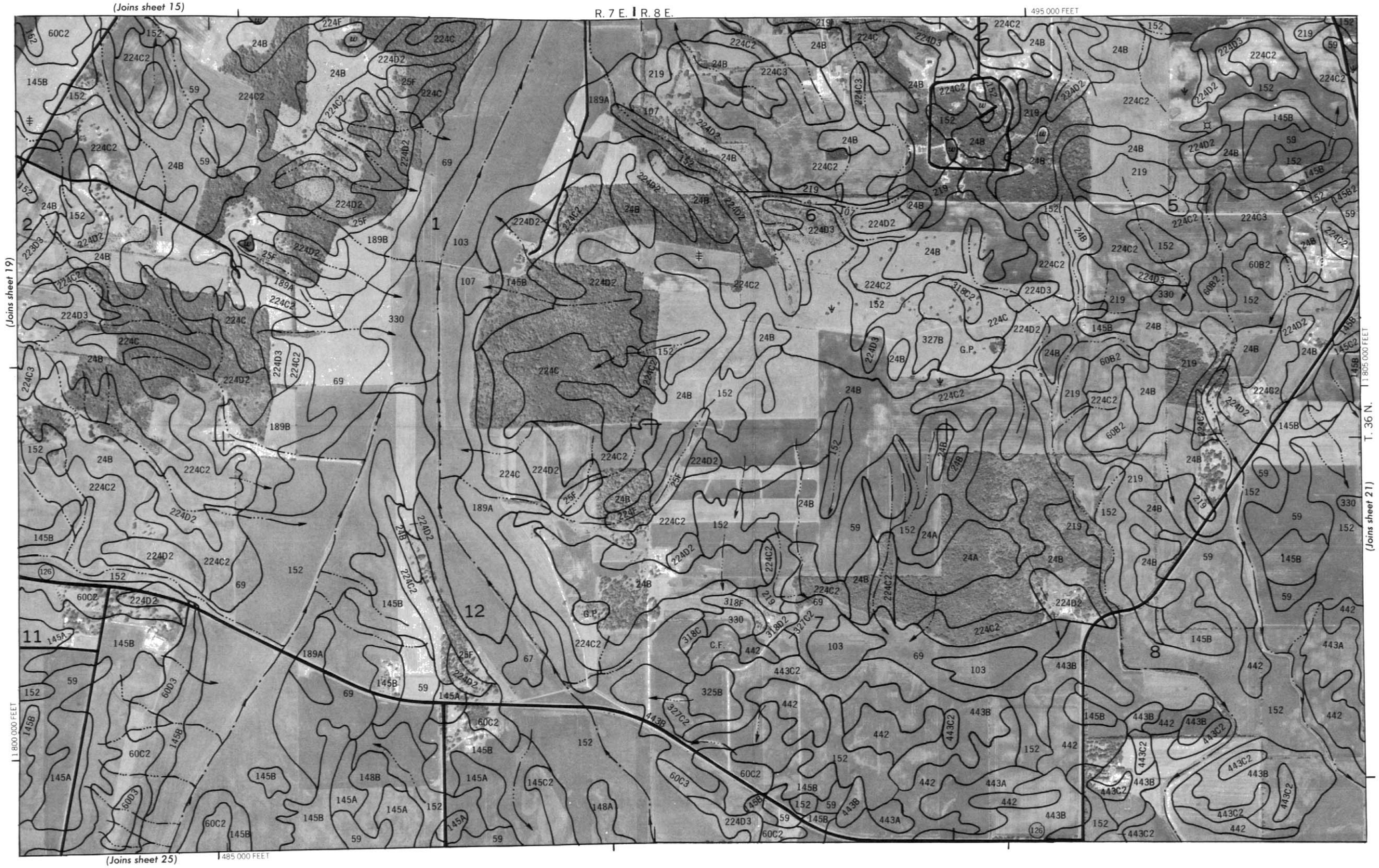
N

1 Mile

5 000 Feet

Scale 1:15 840

0 0 ¼ 1 000 ½ 2 000 ¾ 3 000 1 4 000 5 000



KENDALL COUNTY, ILLINOIS NO. 20

This map is compiled at 1:7.5 and 1:7.4 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies
Coordinate grid ticks and land division corners if shown are approximately positioned

KENDALL COUNTY, ILLINOIS NO. 21

This map is compiled on 1971 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Cadastral data and land division corners, if shown, are approximately positioned.

21

N

500 000 FEET

R. 8 E.

(Joins sheet 16)

T. 36 N.

1 805 000 FEET

(Joins sheet 20)

(Joins inset B, sheet 6)

1 800 000 FEET

(Joins sheet 26)

515 000 FEET

1 Mile

5 000 Feet

Scale 1:15 840

22

N

1 Mile

5 000 Feet

Scale 1:15 840

(Joins sheet 17)

R. 6 E.

440 000 FEET

1 795 000 FEET

T. 36 N.

1 790 000 FEET

(Joins sheet 23)

(Joins sheet 27)

430 000 FEET

LA SALLE COUNTY

Millbrook

Trollenback

RIVER

FOX

NORTHERN

BURLINGTON

QUARRY

QUARRY

G.P.

C.F.

KENDALL COUNTY, ILLINOIS NO. 22

This map is compiled on 1973 and 1974 aerial photographs by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners of shown are approximately positioned.

KENDALL COUNTY, ILLINOIS NO. 23

445 000 FEET

1 795 000 FEET

T. 36 N.

R. 6 E. | R. 7 E.

(Joins sheet 18)

(Joins sheet 22)

(Joins sheet 24)

(Joins sheet 28)

460 000 FEET

1 790 000 FEET

15 14 13 18 22 23 24 19

Flattenmeer Creek

Middle Aux Sable Creek

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0
¼ 1 000
½ 2 000
¾ 3 000
1 4 000
5 000

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 24

(24)

N

1 Mile

5 000 Feet

Scale 1:15 840

0 0

¼ 1 000

½ 2 000

¾ 3 000

1 4 000

1¼ 5 000

(Joins sheet 19)

R. 7 E.

480 000 FEET

1 795 000 FEET

T. 36 N.

(Joins sheet 23)

1 790 000 FEET

(Joins sheet 25)

465 000 FEET

(Joins sheet 29)

16

17

15

14

21

20

22

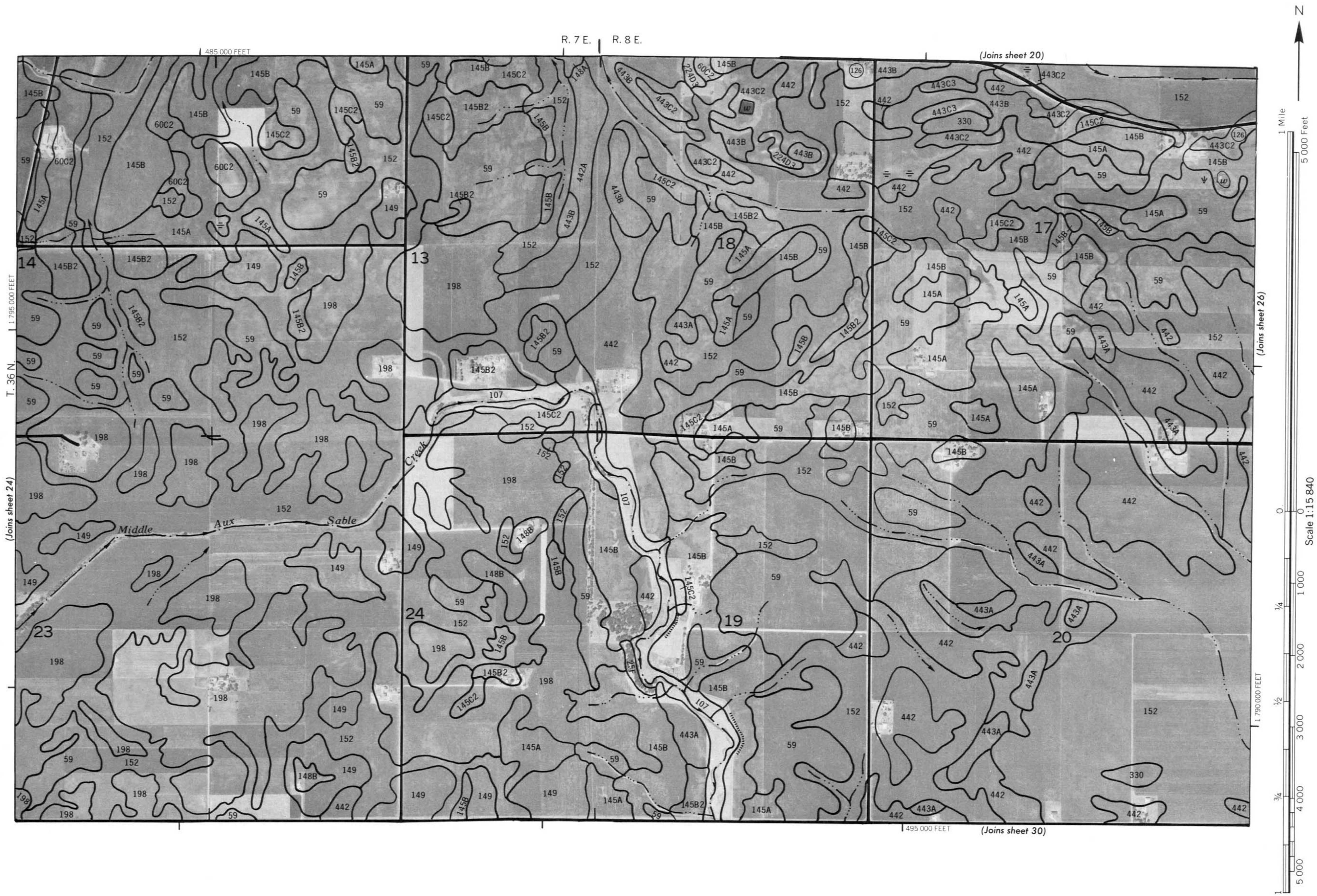
23

Middle Aux Sable Creek

KENDALL COUNTY, ILLINOIS NO. 24

This map is compiled on 1971 aerial photographs by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Landside grid ticks and land division corners shown are approximately positioned.

25



KENDALL COUNTY, ILLINOIS NO. 25

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 26

26

N

1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 21)

R. 8 E.

515 000 FEET

(Joins sheet 25)

T. 36 N.

1 795 000 FEET

1 790 000 FEET

(Joins inset BB, sheet 6)

500 000 FEET

(Joins sheet 31)

Creek

Sable

Aux

East

KENDALL COUNTY, ILLINOIS NO. 26

KENDALL COUNTY, ILLINOIS NO. 27

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KENDALL COUNTY, ILLINOIS — SHEET NUMBER 28

28

N

1 Mile

5 000 Feet

0

Scale 1:15 840

1/4 1 000

1/2 2 000

3/4 3 000

1 4 000

1 1/4 5 000

(Joins sheet 23)

(Joins sheet 27)

(Joins sheet 33)

(Joins sheet 29)

R. 6 E. | R. 7 E.

T. 36 N.

460 000 FEET

450 000 FEET

1 785 000 FEET

1 780 000 FEET

27 26 25 30 34 35 36 31

Helmar

KENDALL COUNTY, ILLINOIS NO. 28

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 29

29

N

465 000 FEET

R. 7 E.

(Joins sheet 24)

1 785 000 FEET

T. 36 N.

(Joins sheet 28)

(Joins sheet 30)

(Joins sheet 34)

480 000 FEET

1 780 000 FEET

Kentland

1 Mile

5 000 Feet

Scale 1:15 840

KENDALL COUNTY, ILLINOIS NO. 29

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(30)

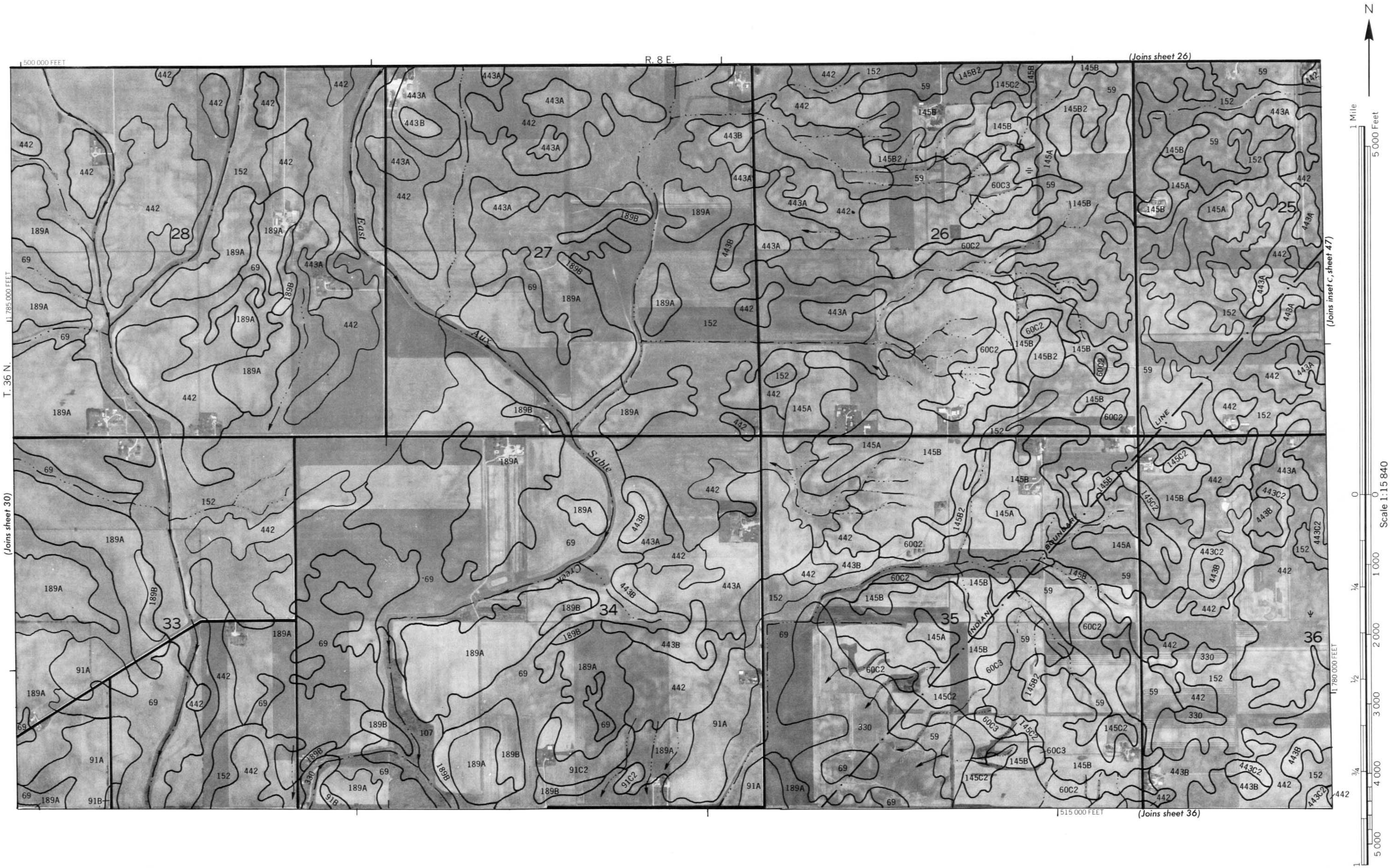
N

1 Mile
5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1 Mile
0 1 000 2 000 3 000 4 000 5 000 Feet

KENDALL COUNTY, ILLINOIS NO. 30



KENDALL COUNTY, ILLINOIS NO. 31

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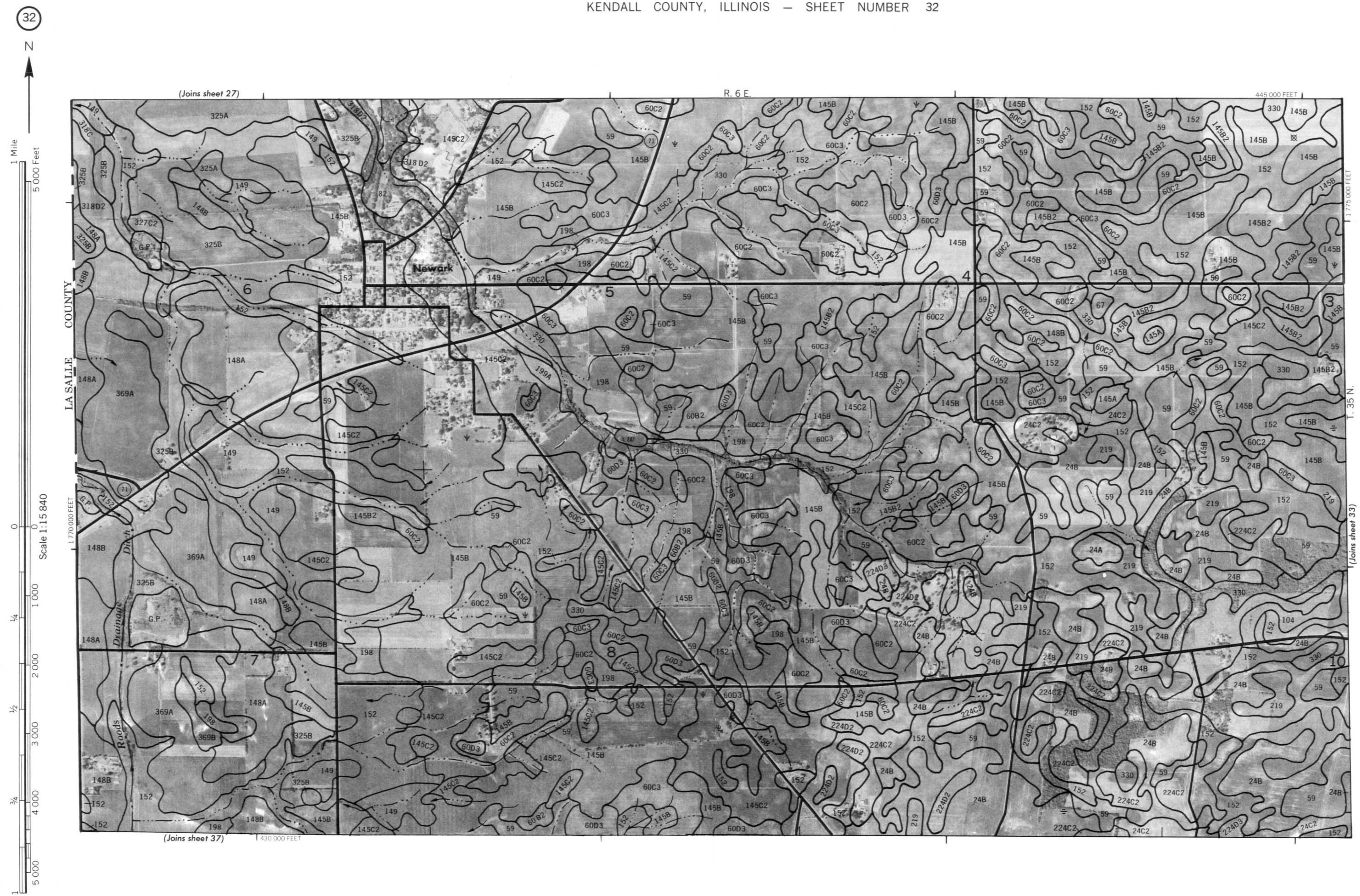
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



KENDALL COUNTY, ILLINOIS NO. 32

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Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 33

33

N

1 Mile

5 000 Feet

Scale 1:15 840

450 000 FEET

460 000 FEET

1 775 000 FEET

1 770 000 FEET

R. 6 E. | R. 7 E.

T. 35 N.

(Joins sheet 28)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 38)

Lisbon

Crea[illegible]

KENDALL COUNTY, ILLINOIS NO. 33

This map was compiled in 1977 and 1978 from aerial photography by the U.S. Department of Agriculture Soil Conservation Service and cooperating agencies.
Cartographic data base and land division corners shown are approximate.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 34

34

N

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

1 000 2 000 3 000 4 000 5 000

(Joins sheet 29)

R. 7 E.

480 000 FEET

1 775 000 FEET

1 770 000 FEET

1 765 000 FEET

(Joins sheet 33)

(Joins sheet 39)

(Joins sheet 35)

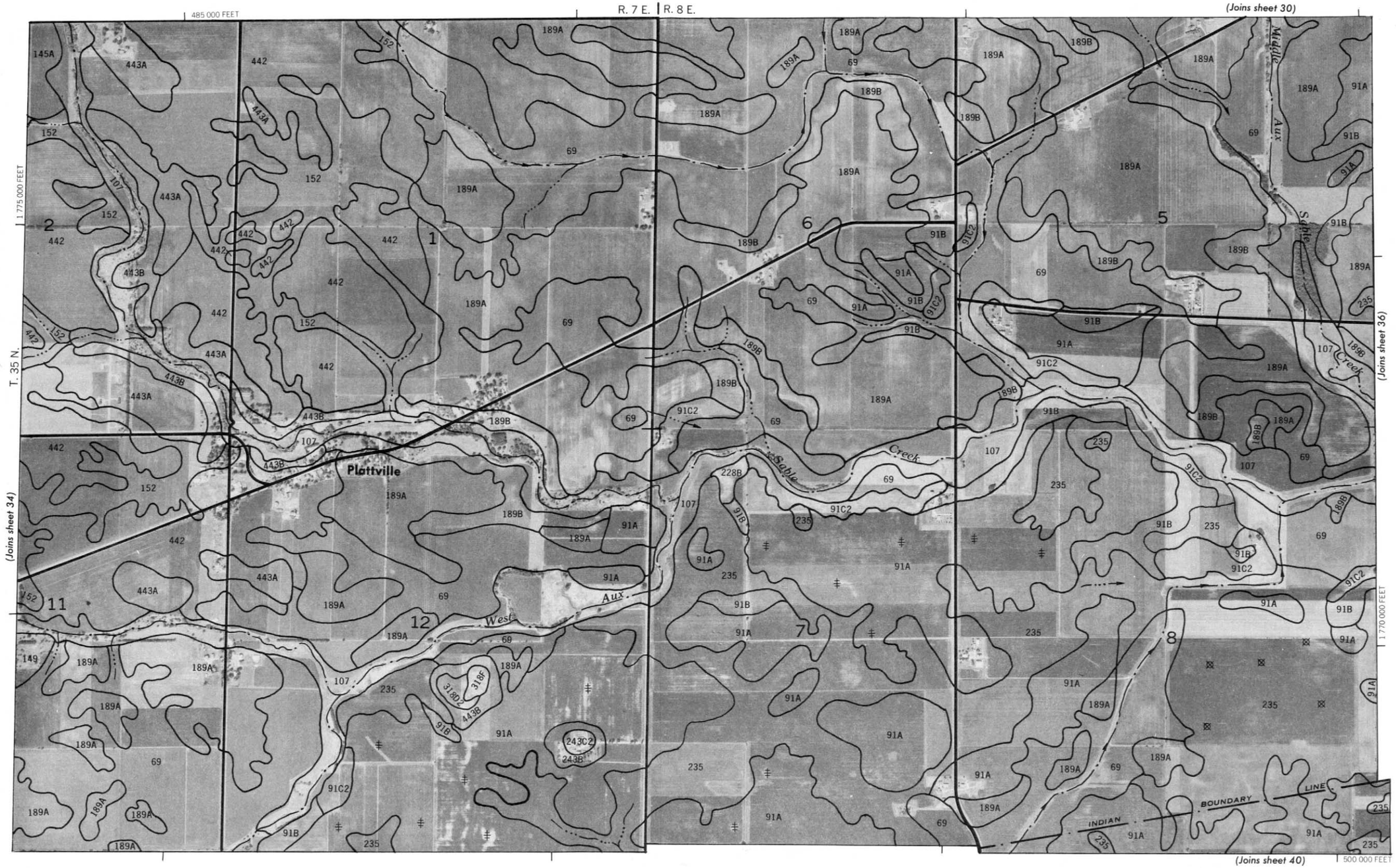
T. 35 N.

Lisbon

5 4 3 2 8 9 10 11

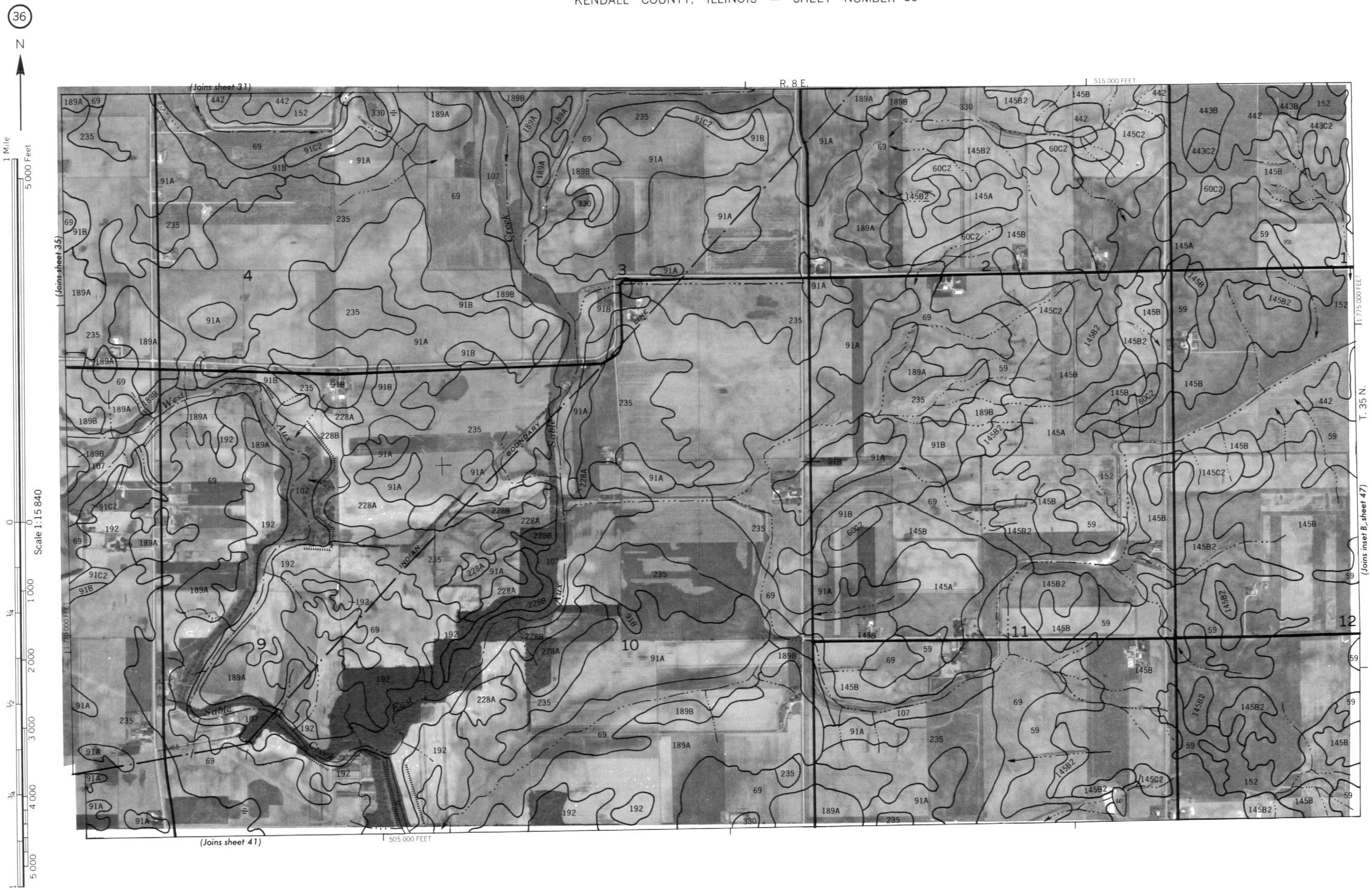
KENDALL COUNTY, ILLINOIS NO. 34

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 35



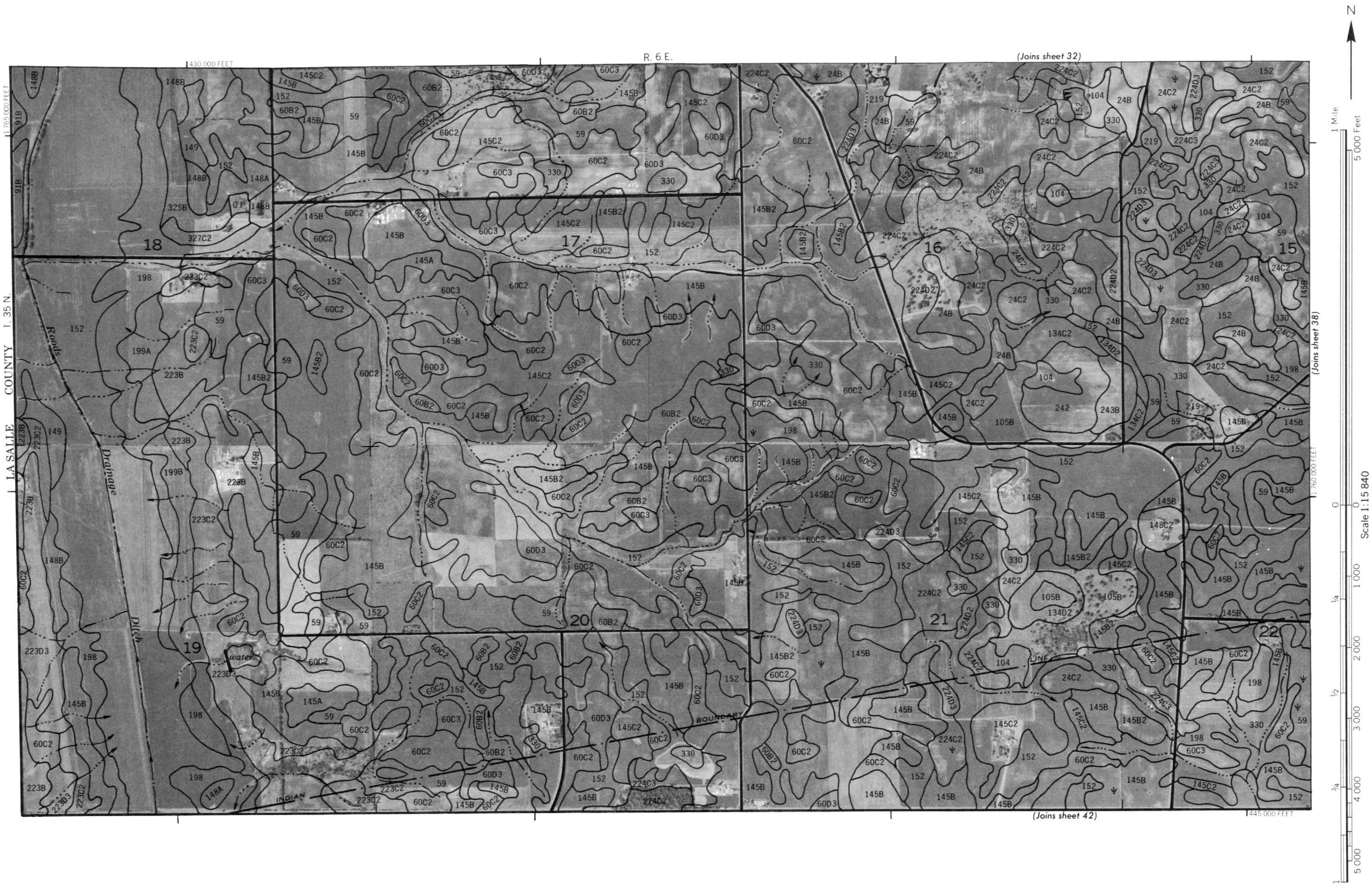
KENDALL COUNTY, ILLINOIS NO. 35

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Continuous grid ticks and land division corners, if shown, are approximately positioned.

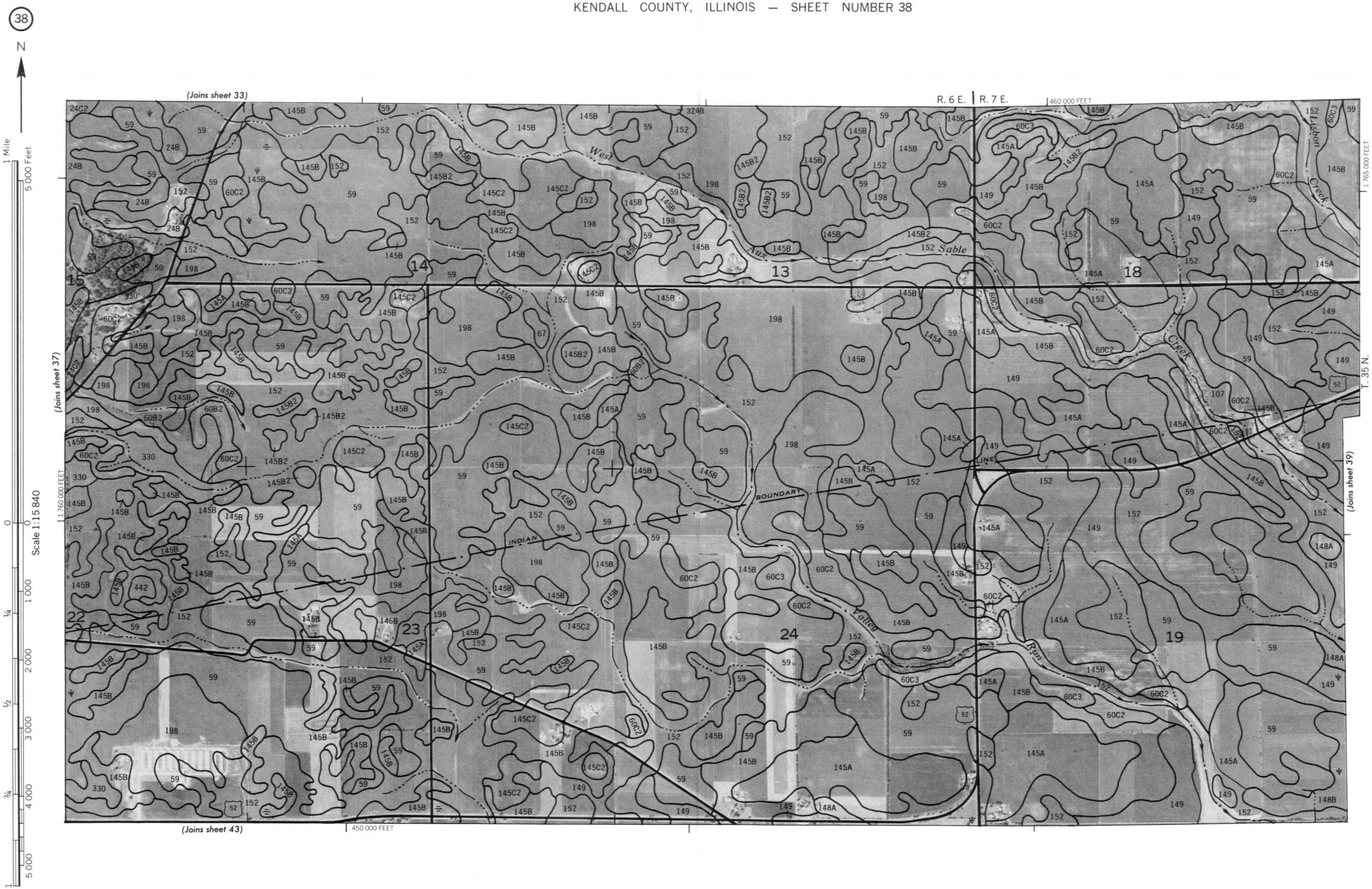


KENDALL COUNTY, ILLINOIS NO. 36

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

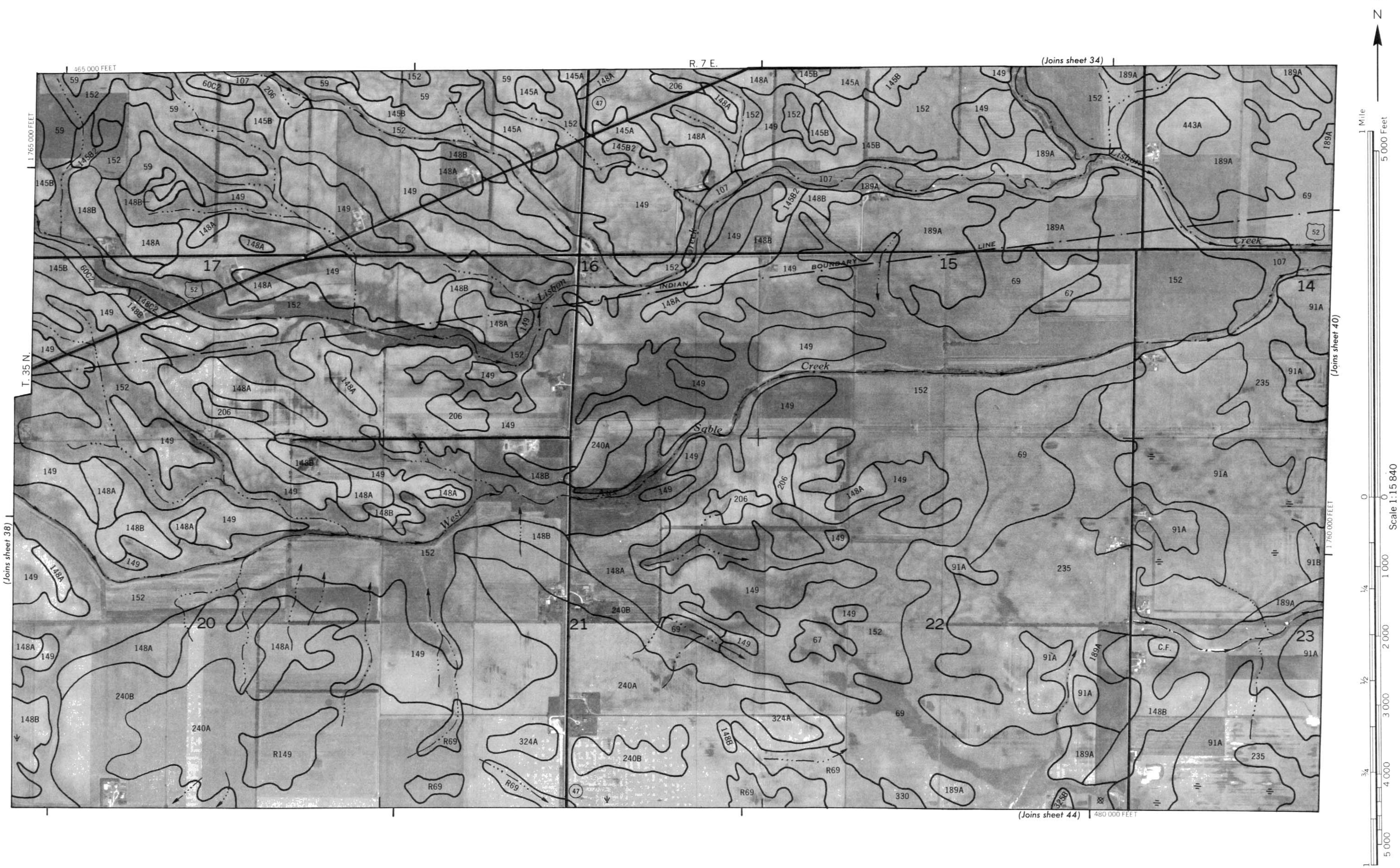


This map is compiled on 1973 and 1974 aerial photographs by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



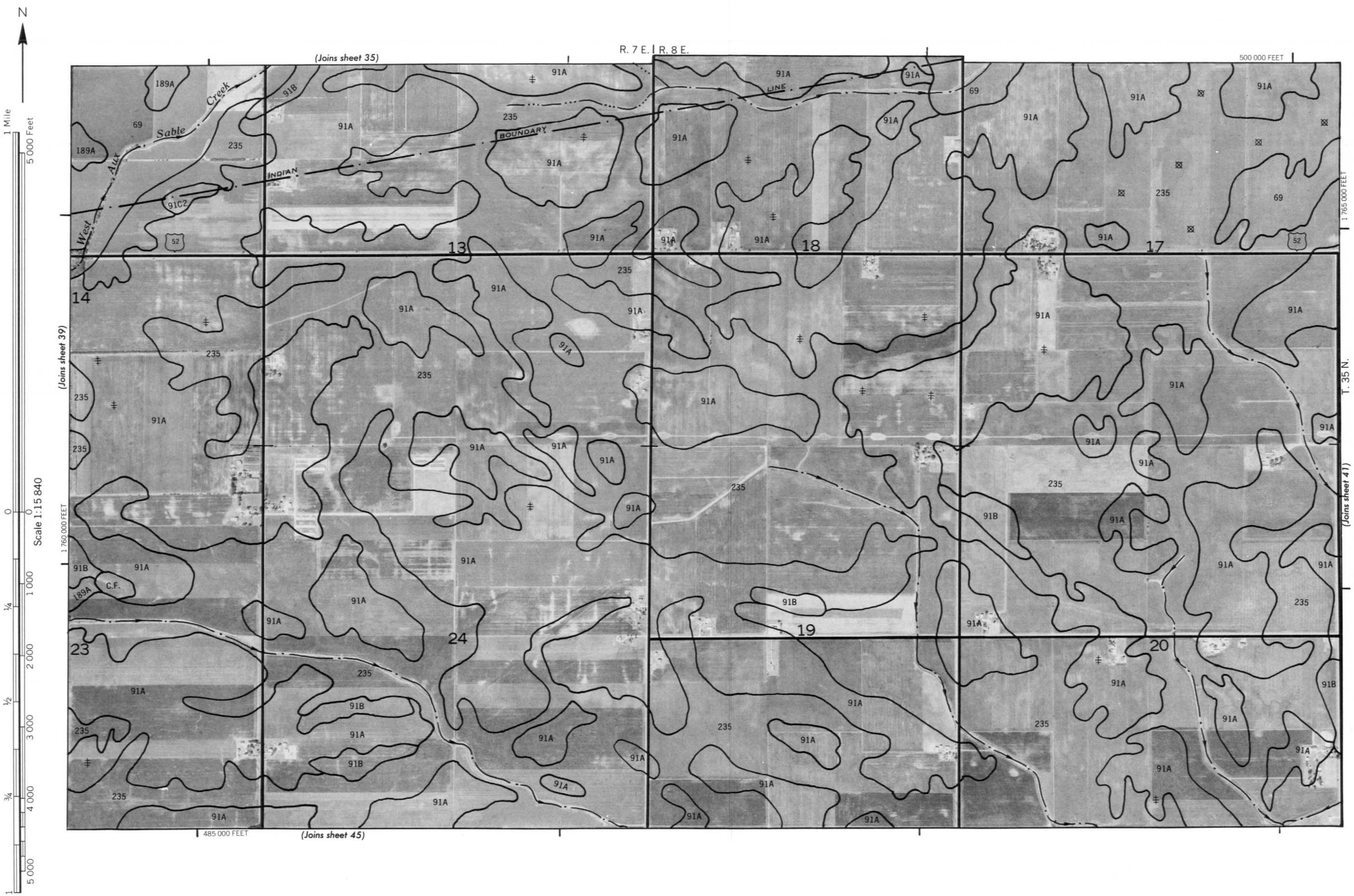
KENDALL COUNTY, ILLINOIS NO. 38

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



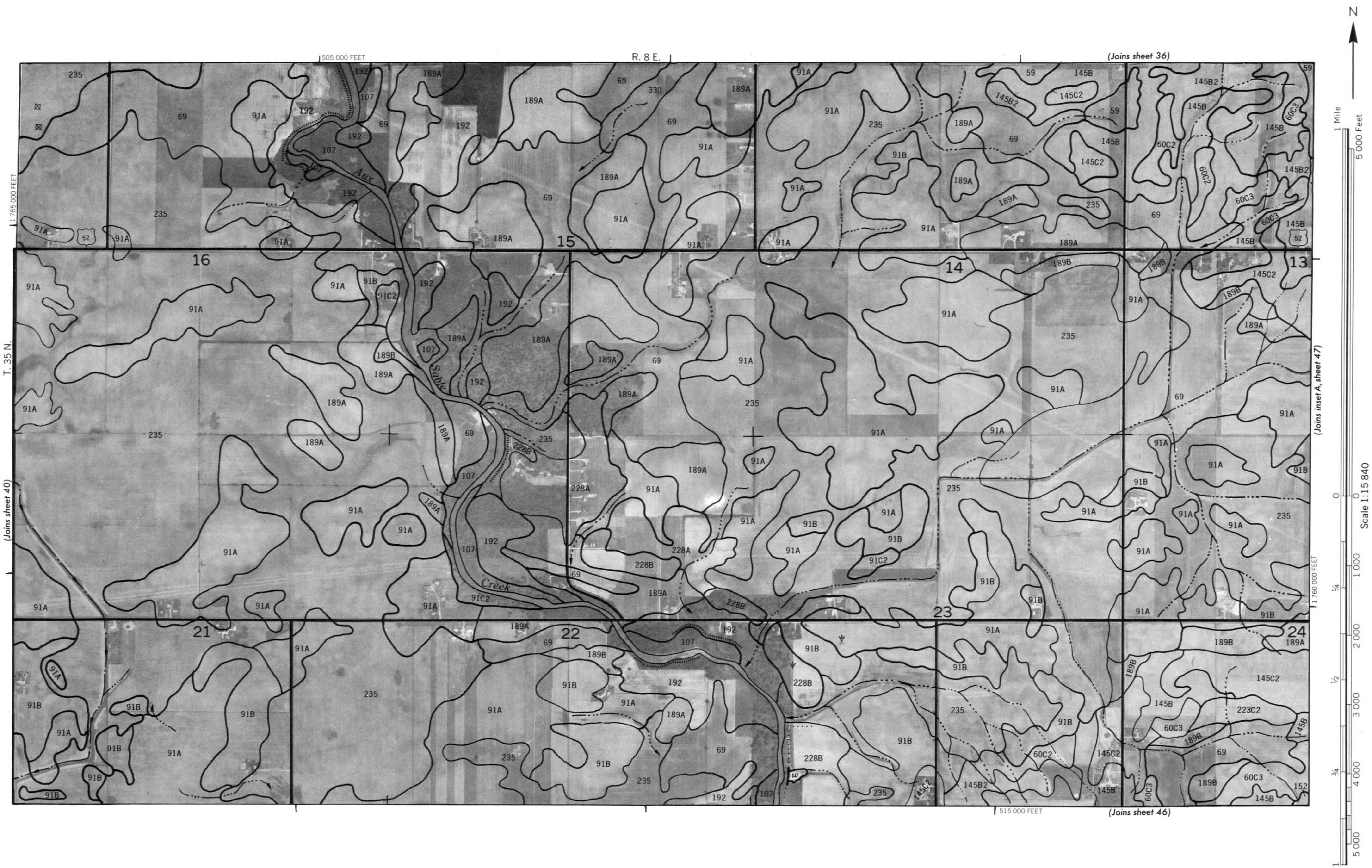
KENDALL COUNTY, ILLINOIS NO. 39

(40)



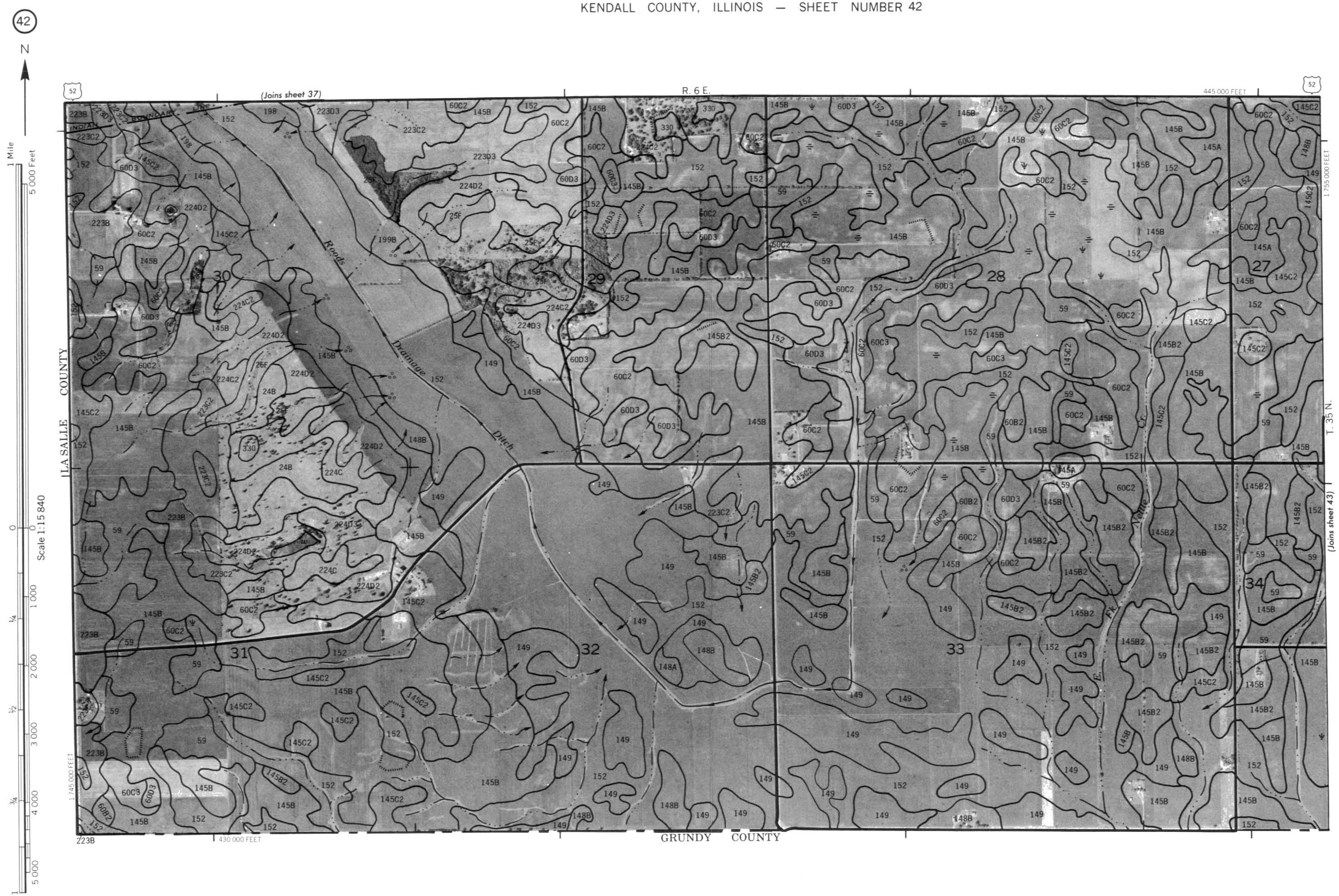
KENDALL COUNTY, ILLINOIS NO. 40

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



KENDALL COUNTY, ILLINOIS NO. 41

This map is compiled on 1973 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



KENDALL COUNTY, ILLINOIS NO. 42

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 43

N

R. 6 E. R. 7 E.

450 000 FEET

1 755 000 FEET

1 750 000 FEET

460 000 FEET

(Joins sheet 38)

(Joins sheet 44)

(Joins sheet 42)

T. 35 N.

Saratoga Creek

Lisbon

Pickerel Creek

GRUNDY COUNTY

27 26 25 30

34 35 36 31

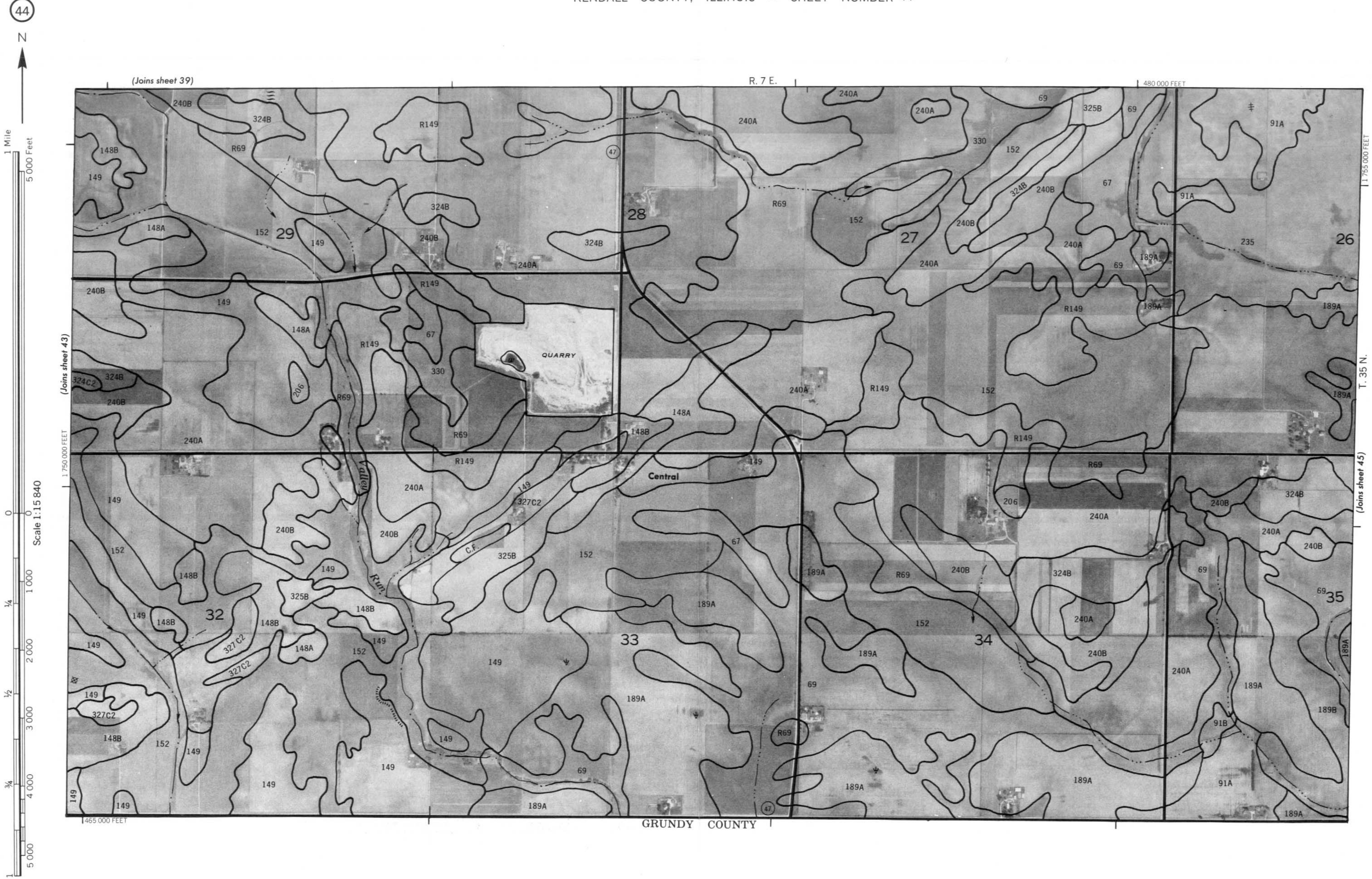
1 Mile

5 000 Feet

Scale 1:15 840

KENDALL COUNTY, ILLINOIS NO. 43

This ratio is compiled on 1913 and 1974 aerial photographs by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.



KENDALL COUNTY, ILLINOIS NO. 44

This map is compiled on 1973 and 1974 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 45

45

N

KENDALL COUNTY, ILLINOIS NO. 45

485 000 FEET

R. 7 E.

R. 8 E.

(Joins sheet 40)

1 755 000 FEET

T. 35 N.

(Joins sheet 44)

(Joins sheet 46)

750 000 FEET

500 000 FEET

GRUNDY COUNTY

26 25 30 29

35 36 31 32

Valley Run

1 Mile

5 000 Feet

Scale 1:15 840

0 ¼ ½ ¾ 1

0 1 000 2 000 3 000 4 000 5 000

KENDALL COUNTY, ILLINOIS — SHEET NUMBER 46

46

N

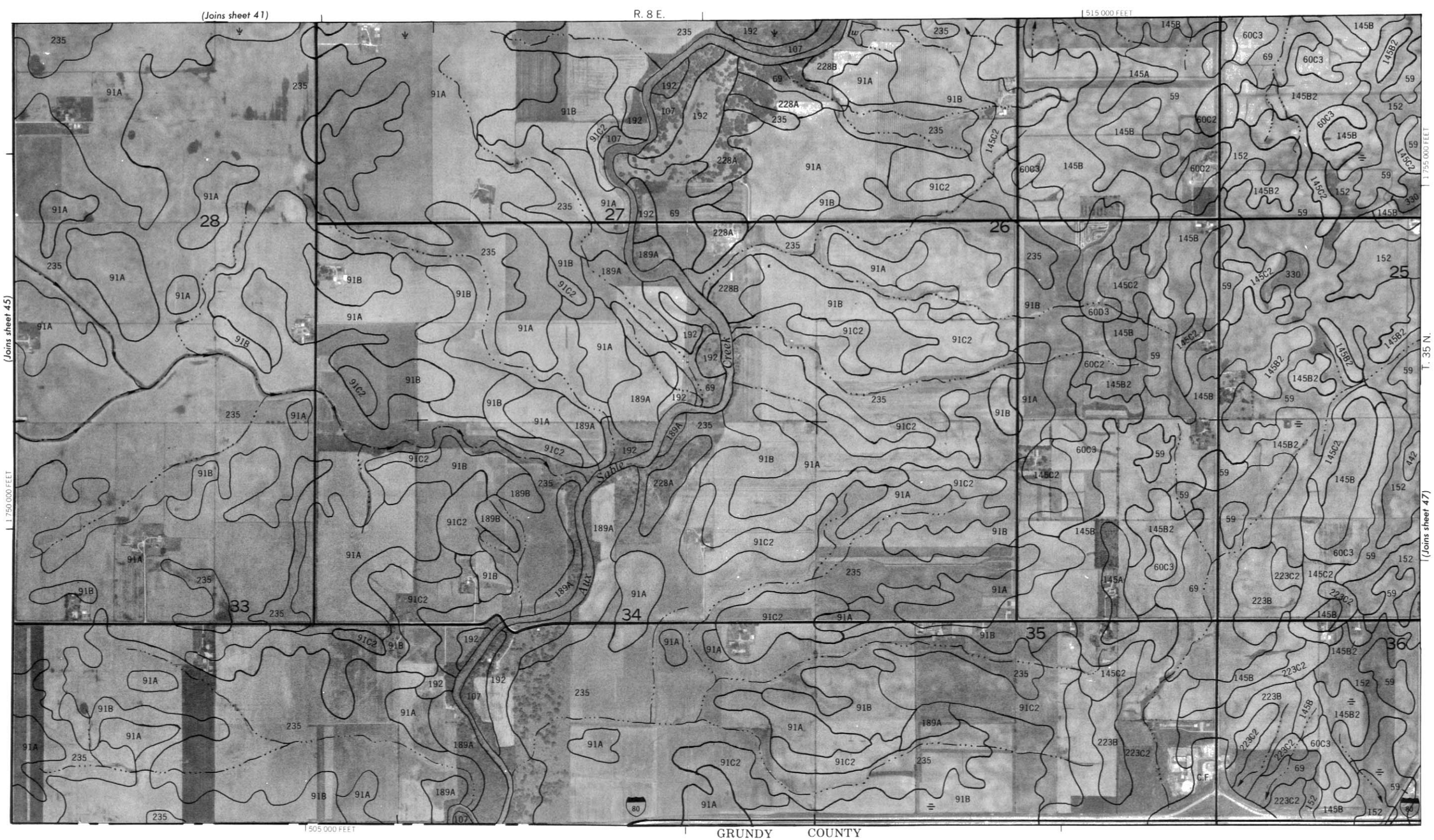
1 Mile

5 000 Feet

Scale 1:15 840

0 1/4 1/2 3/4 1

1 000 2 000 3 000 4 000 5 000

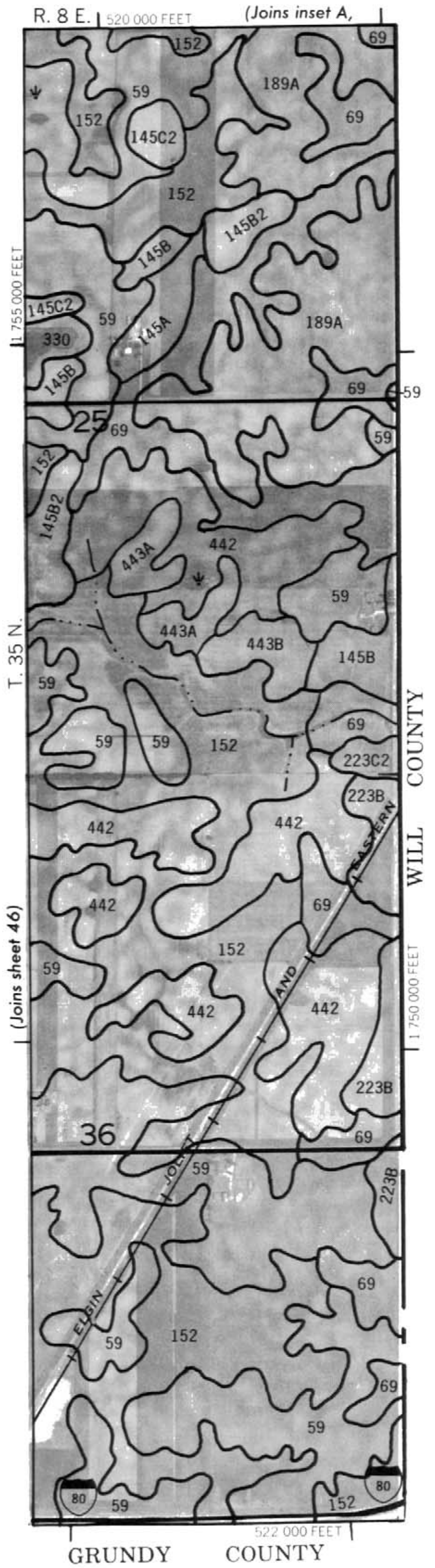


KENDALL COUNTY, ILLINOIS NO. 46

(47)

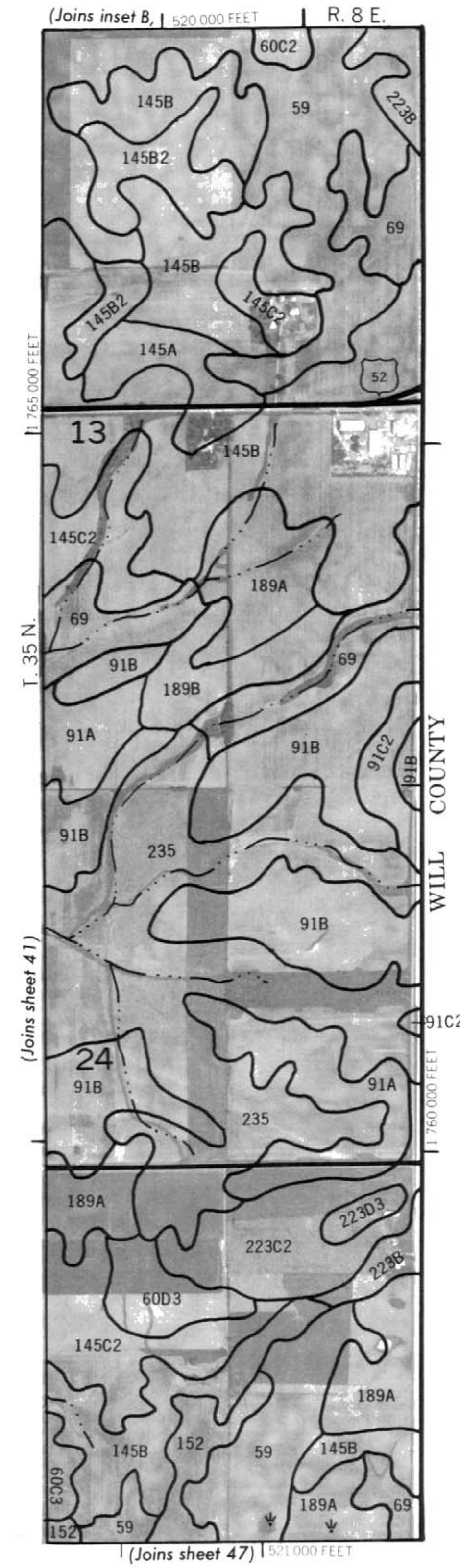
KENDALL COUNTY, ILLINOIS NO. 47

This map is compiled on 1972 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



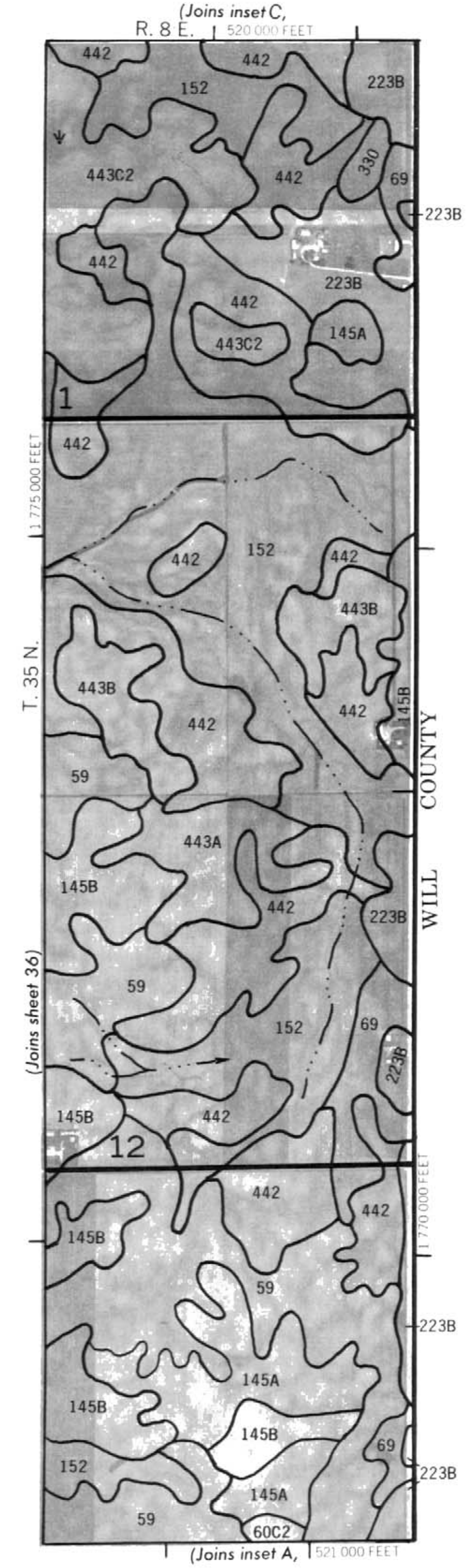
2000 AND 5000-FOOT GRID TICKS

INSET A



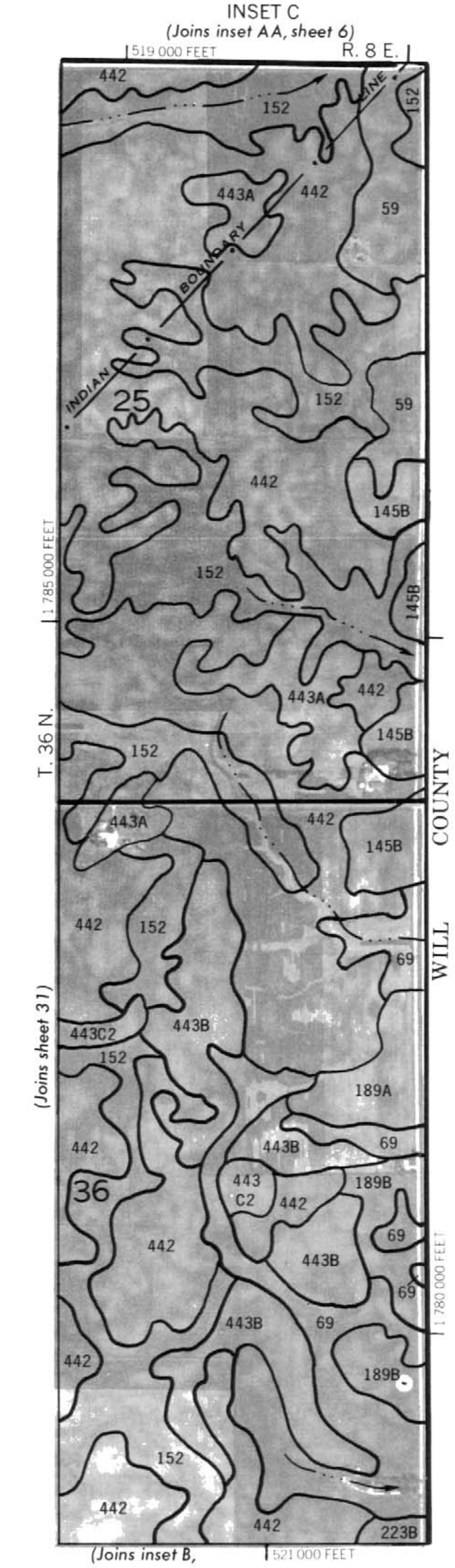
1000 AND 5000-FOOT GRID TICKS

INSET B



1000 AND 5000-FOOT GRID TICKS

INSET C



2000 AND 5000-FOOT GRID TICKS